United States Department of the Interior
Bureau of Land Management

Preliminary PMWHR Bait/Water Trapping Gather and Fertility Control
Environmental Assessment
DOI-BLM-MT-A010-2017-0055-EA
Tiered to the
Pryor Mountain Wild Horse Range Environmental Assessment
MT-010-08-24
And Herd Management Area Plan May 2009

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BLM

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple-use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific and cultural values.

BLM/MT/PL-08/12

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1.0 BACKGROUND INFORMATION

1.1 Introduction

This Environmental Assessment (EA) has been prepared to analyze the Bureau of Land Management (BLM) Billings Field Office (BiFO) proposal to conduct a wild horse gather plan for the Pryor Mountain Wild Horse Range (PMWHR) and to make changes to the current fertility control prescription. The wild horse gather plan would allow for an initial gather and follow-up maintenance gathers to be conducted until conditions warrant a change and appropriate management levels are achieved and maintained. The changes to the fertility control prescription would allow for the four year old age class to be removed from the fertility control prescription. The proposed gather would include removing excess wild horses from inside the Pryor Mountain Wild Horse Range. Fertility control treatments would occur throughout the year and could begin on mares 18 months of age.

This EA is a site-specific analysis of the potential impacts that could result from implementation of the Proposed Action or alternatives. The EA assists the BLM Billings Field Offices in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts would result from the analyzed actions. An EA provides analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI).

This EA includes information from both of the 2015 Pryor Mountain Wild Horse Range Bait/Water Trapping EA and the 2015 Pryor Mountain Wild Horse Range Fertility Control EA the 2016 appropriate management level (AML) recalculation for the Pryor Mountain Wild Horse Range (PMWHR), and current information about current rangeland utilization levels and the current population of wild horses with the PMWHR.

After review and analysis of comments provided by the public during the scoping comment period from September 14, 2017 to October 6, 2017 this EA has been designed in part from scoping comments from members of the public, data review, and collection, and BLM interdisciplinary team review.

This EA is tiered to the 2009 Pryor Mountain Wild Horse Range/Territory EA (MT-010-08-24) and Herd Management Area Plan (HMAP) in accordance with the Council on Environmental Quality (CEQ) regulations, 40 CFR 1502.2, and incorporates by reference all the descriptions of the affected environment and impacts analyzed in the 2009 HMAP and EA and subsequent Finding of No Significant Impact (FONSI) and Decision Record (DR). This EA also incorporates by reference Pryor Mountain Wild Horse Range Fertility Control Tiered Environmental Assesment December 2010 DOI-BLM-MT-010-2011-004-EA and the Pryor Mountain Wild Horse Range Fertility Control Tiered Environmental Assesment December 2015 DOI-BLM-MT-010-2015-0006-EA that are tiered to the 2009 PMWHR and HMAP EA.

This EA has been prepared to analyze the impacts associated to wild horses and other identified resources from conducting or not conducting a bait/water gather operations and fertility control.

Incorporation by reference and tiering provide opportunities to reduce paperwork and redundant analysis in the National Environmental Policy Act (NEPA) process. When incorporating by reference, the author refers to other available documents that cover similar issues, effects, and/or resources considered in the NEPA analysis that is being prepared. Incorporation by reference allows brief summarizations of relevant portions of other documents rather than repeating them.

Tiering is a form of incorporation by reference that refers to previous EAs or Environmental Impact Statements (EIS). Incorporation by reference is a necessary step in tiering, but tiering is not the same as incorporation by reference. Tiering allows for narrowing the scope of the subsequent analysis and focuses on issues that are ripe for decision-making, while incorporation by reference does not. Only EAs or EISs may be tiered to, whereas one may incorporate by reference from any type of document.

Tiering uses the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents (40 CFR 1508.28, 40 CFR 1502.20). This allows the tiered NEPA document to narrow the range of alternatives and concentrate solely on the issues not already addressed. Tiering is appropriate when the analysis for the proposed action will be a more site-specific or project-specific refinement or extension of the existing NEPA document.

The author may tier to a NEPA document for a broader action when the narrower action is clearly consistent with the decision associated with the broader action. In the tiered document, there is no need to reexamine alternatives analyzed in the broader document. The tiered document is focused on those issues and mitigation measures specifically relevant to the narrower action but not analyzed in sufficient detail in the broader document.

1.2 Management Situation

After analyzing the monitoring data collected since the 2015 PMWHR non-helicopter gather, and comparing to the annual wild horse population in 2016, and the current 2017 population, the BLM has determined that excess wild horses are present in the PMWHR. BLM has also considered the monitoring results from 2015 (post gather), 2016 and 2017. The BLM's monitoring data was compared to forage utilization objectives within the HMAP which is 45% use. Use levels have continued to exceed the utilization objectives identified in the HMAP when wild horse number exceed the established AML. Monitoring data further reaffirms the current AML of 90 to120 wild horses (excluding current year's foals) as determined in the 2009 EA and HMAP and subsequent FONSI and DR and the subsequent recalculation of AML in 2016.

Monitoring data confirms that the use patterns are shifting primarily due to the installation of guzzlers from 2010, water developments on low elevation springs, and wild horses limited to the boundaries of the PMWHR/Territory. Greater interchange of bands is occurring since the HMAP implementation of a 50/50 sex ratio rather than a 70/30. Heavy use is being measured in the mid-slope due to wild horse use. Although this is identified as part of the HMAP as an area where additional grazing should occur, the population as of March 1, 2017 of 165 wild horses is beyond the capacity of the range in order to protect it from deterioration.

Implementation of the HMAP continues to occur as nine water catchment sites consisting of 12 guzzlers are installed and collecting water, along with one catchment trough system on Sykes Ridge. Another catch pond has been completed on Burnt Timber Ridge south of Cheyenne Flat. One seep was developed on Bad Pass road to ensure year-round water, and two riparian protection and water enhancement projects were completed at Cottonwood Spring and Little Sykes riparian areas. Fertility control has been conducted from 2011 to 2017, with 70-80% of the mares treated each year (depending on demographics). A livestock drift fence was completed at Sykes entrance to keep livestock out of the wild horse range, and the USFS reconstructed the north boundary fence. A portion of the BLM Administrative Fence was removed in 2016 with more planned for removal after the boundary fence has received maintenance to ensure that Pryor Mountain Wild Horses do not leave the designated range, this helped with use levels in 2017, but it did not help reduce grazing pressure and utilization level at higher elevations.

As part of the implementation of the HMAP, the Pryor Mountain Wild Horse Range Prescribed Fire EA and DR/FONSI was issued March 2014. This action is designed to return the fire regime to a more natural state with smaller more frequent fires that would not be catastrophic in scale, while simultaneously improving forest health habitat for wildlife resources, wild horses, and watershed protection. The need is also to promote a more natural regime to protect the wilderness values present within the wilderness study areas.

Wild horse population recruitment under current management and fertility control treatments has been reduced from 17.5% to 8%. This is equates to about 12-13 foals born annually with about 8-10 surviving to 1 years of age. Implementation of fertility control has a minimum of one year lapse time until population results are realized. Darting for 2017 is complete. In 2018, approximately 12 foals are anticipated to be born. Impacts associated with making changes to fertility control prescriptions may not be realized until foaling season 2020.

As stated in the HMAP DR, "The population will not be taken to the low range of AML when fertility control is utilized." A fertility control program designed to last until from 2011-2015 as part of the HMAP was completed. An additional fertility control program has been in place from 2015 to present. When fertility control is in effect the BLM is managing for 120 wild horses (excluding current year's foals). The proposed action and alternative is designed to help protect rangelands from deterioration and maintain a thriving natural ecological balance and multiple-use relationships, as described in the HMAP. The gather techniques and implementation would be described and analyzed in two action alternatives based upon public input obtained during the scoping process.

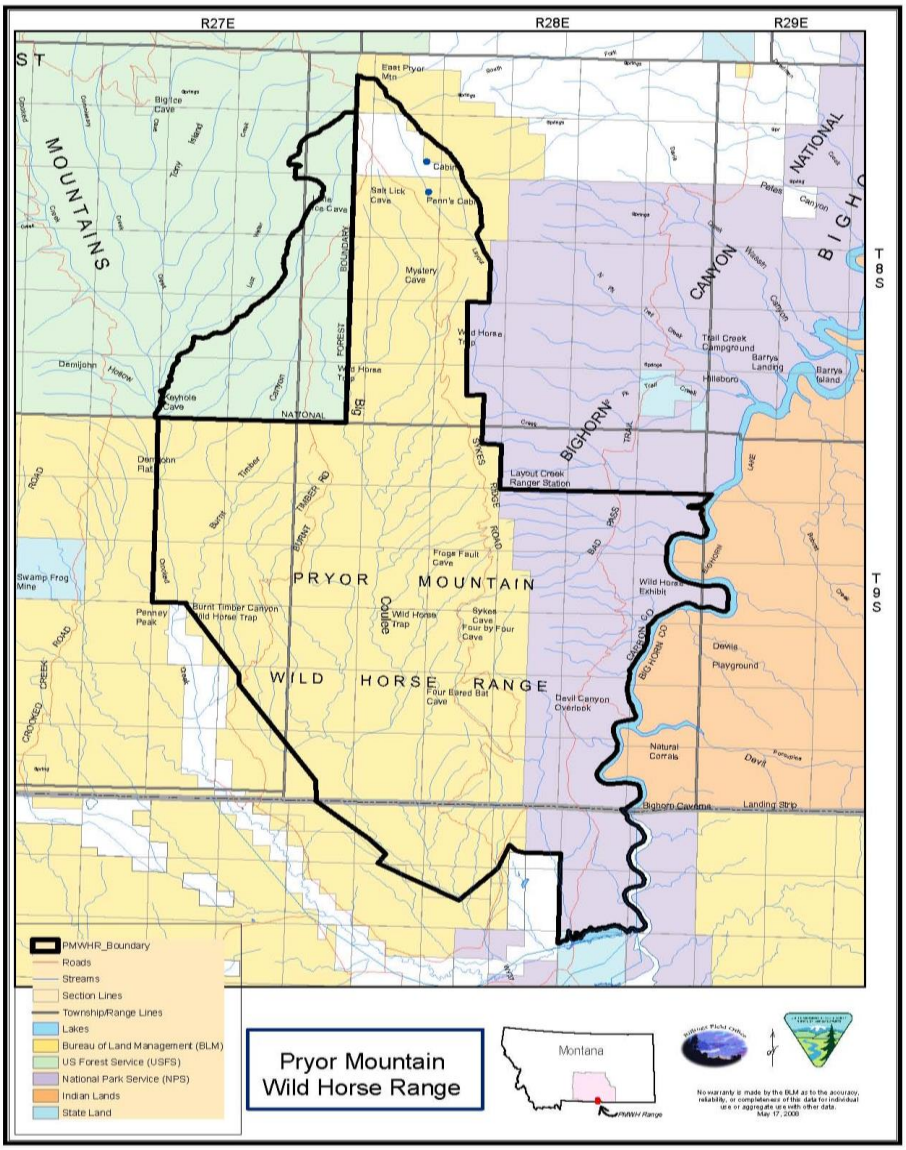
The BLM BiFO proposes to gather and remove excess wild horses that have potential for adoption from the Pryor Mountain Wild Horse Range (PMWHR) using bait/water/foot herding gather techniques and continue fertility control via remote darting. Even with the use of fertility control the BLM has measured heavy and severe utilization of vegetation forage species and has determined excess wild horses are present on the range. The use patterns of the wild horses within the PMWHR have been shifting since the 2012 gather and range degradation continues in the same areas.

The gather would begin in 2018 as soon as the EA and decision process is complete and environmental conditions allow. The Proposed Action and Alternative A are designed to help protect rangelands from deterioration from an overpopulation of wild horses and help maintain a thriving natural ecological balance and multiple-use relationships. The method of capture would be water/bait-trapping and limited herding using temporary traps of portable panels throughout selected sites within the PMWHR. Under the Proposed Action and Alternative A, after targeted excess wild horses are captured in the trap, they would be sorted off from their band and transported to the Britton Springs administrative site where they would be prepared and offered for adoption or placed in training. The changes to the current fertility control program would be implemented as soon as the EA and decision process is complete.

1.3 Location

The project area is located in southeastern Carbon County, Montana, and northern Big Horn County, Wyoming, in the PMWHR (see Map 1). The area is approximately 50 to 70 miles south of Billings, Montana, and 10 miles north of Lovell, Wyoming. Elevations range from 3,850 feet to 8,750 feet above sea level.

Map 1. Pryor Mountain Wild Horse Range



1.4 Purpose and Need

The purpose of the Proposed Action is to remove excess wild horses from the PMWHR, to manage wild horses to achieve and maintain established AML ranges for the PMWHR and to reduce the wild horse population growth rate in order to prevent undue or unnecessary degradation of the public lands by protecting rangeland resources from deterioration associated with an overpopulation of excess wild horses in the PMWHR, and to restore a thriving natural ecological balance and multiple use relationship on the public lands consistent with the provisions of Section 1333 (a) of the *Wild Free-Roaming Horses and Burros Act of 1971.*

The need for the Proposed Action is to protect rangeland resources and to prevent unnecessary or undue degradation of the public lands associated with excess wild horses within the PMWHR and use of rangeland resources by wild horses.

Decision to be made through EA: The BLM will decide whether or not to gather and remove excess wild horses or how to implement a gather(s) from the PMWHR in order to make progress towards maintaining the appropriate management level, achieve a thriving natural ecological balance, and make progress towards standards of rangeland health, through water and bait trapping with herding. The BLM will also decide whether or not to make changes to the current fertility control prescription.

1.5 Relationship to Planning

The proposed population control is in conformance with the Billings Resource Management Plan (2015) Record of Decision (ROD) wild horse goals; 1) Maintain, protect, manage and control a healthy wild horse herd inside the HMA within the appropriate management level (AML) to ensure a thriving natural ecological balance, while preserving multiple use relationships with other uses and resources, and making progress towards Standards for Rangeland Health Standards 1 and 5; 2) Maintain a wild horse herd that exhibits a diverse age structure, genetic diversity, and any characteristics unique to the Pryor horses; 3) Manage wild horses within a balanced program which considers all values without impairment to the productivity of the land.

The 2009 Pryor Mountain Wild Horse Range Environmental Assesment (MT-010-08-24) and Herd Management Area Plan and and Finding of No Significant Impact (FONSI) Decision Record (May 2009) analyzed and documented the need to manage the wild horse population between 90-120 wild horses. The HMAP states " manage the herd within AML either through removals, fertility control, natural means, or a combination of methods." The Decision Record states: "The population will not be taken to the low range of AML when fertility control is utilized."

The proposed action is in conformance with the Wild Free-Roaming Horses and Burros Act of 1971 (PL 92-195 as amended) and with all applicable regulations at 43 CFR (Code of Federal Regulations) 4700, 36 CFR 222, and policies outlined by the BLM and USFS. The BLM is the lead agency for coordinating and implementing wild horse management in the Pryor Mountains.

The Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195) as amended, Section 1333 (b) (1), states that the Secretaries of the Interior and Agriculture shall "determine appropriate management levels of wild free-roaming horses and burros on areas of public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization or natural controls on population levels)." According to 43 CFR 4700.0-6, "Wild horses shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat." In addition, 36 CFR 222.21 states that wild horses within USFS territories be administered to "maintain a thriving ecological balance considering them an integral component of the multiple-use resources, and regulating their population and accompanying need for forage and habitat in correlation with uses recognized under the Multiple–Use Sustained Yield Act of 1960."

1.6 Scoping and Public Comment

A public scoping period was held from September 14, 2017 to October 6, 2017 "Capture and Removal of Excess Wild Horses and Continued Fertility Control in the Pryor Mountain Wild Horse Herd." The public was asked to provide input that would help the BLM develop a proposed action and alternatives, further identify issues, potential environmental consequences, mitigation opportunities, monitoring or provide information, data, or analysis to be used in development of an EA. The scoping comments and information provided by the public were used to further develop the proposed action, alternatives and analysis and mitigation related to the potential effects of a wild horse gather. Comments received from the public ranged from asking BLM to remove more numbers of wild horses to doing no gather at all. Similar comments were received on fertility control asking BLM to stop all fertility control to making minor modifications to the existing fertility control program.

2.0 DESCRIPTION OF THE PROPOSED ACTION and ALTERNATIVES

This EA focuses on the Proposed Action, Alternative A, and a No Action alternative. There are no issues to resolve through other action alternatives since no unresolved issues have been identified. The No Action alternative is considered and analyzed to provide a baseline for comparison of the impacts from the Proposed Action and Alternative A.

2.1 Proposed Action

The BLM would capture numerous individual wild horses and bands to selectively remove wild horses that meet the removal criteria. For gathers and removals of excess wild horses BLM would use a Tier approach. Tier 1 would include wild horses that are third foals or more of a given mare and Tier 1 wild horses that were identified and not captured in 2015. Wild horses identified as a Tier 1 would continue to be a Tier 1 until captured and removed, if they are not captured before age 5 they would remain on the PMWHR. Tier 2 would include wild horses that are second foals of a given mare (one foal has to have lived past the age of 1) if the number of wild horses within the PMWHR exceeds AML by 5%. Tier 3 would include wild horses that have characteristics, as defined in the PMWHR Herd Management Area Plan that would make it difficult to meet herd objectives if removed.

The proposed action would primarily consist of removing excess wild horses 1-4 years old through a combination of bait and water trapping, along with some possible herding to move congregated animals away from or towards traps. Gathers and removals would occur at a minimum of every three years, but could occur yearly as long as existing monitoring data identifies utilization levels that exceed 45 % utilization on key forage species. The removal would be conducted to the most feasible extent with the removal considerations identified in the HMAP and to meet herd characteristics objectives. Wild horses 1-4 years old were identified as the target age group for removal since they are young animals that would more readily adjust to a domestic setting and are more desirable by adopters.

Herd health and animal characteristics data would be collected as part of continued monitoring of the wild horse herd. Genetic samples would be taken from removed animals to continue monitoring of herd health and to track genetic variation through hair samples from the tail or mane consistent with current accepted policy and protocol.

Wild horses that are suspected to be a foal from inbreeding would be targeted for removal regardless of the number of foals that either parent has in order to preserve herd characteristics. Wild horses suspected of being inbred would be removed after a foal is weaning age and be offered for adoption or placed into training. The BLM would continue to capture and remove these wild horses regardless of age, focusing on removal before they are of breeding age. Wild horses with injuries or other potential health concerns that could present problems to herd health could be removed regardless of age. Capture and removal of suspected inbred wild horses or wild horses with injuries or other potential health concerns could occur as soon as BLM is through decision process and would remain in effect until conditions warrant a change.

As BLM works to balance birth rates with death loss within the PMWHR to achieve and maintain AML, BLM would not intentionally remove an entire age class. The proposed action would leave a minimum of 4 wild horses from each age class using the Tier approach. If a Tier 1 or 2 wild horse has a foal at the time of capture and removal, the foal will be removed with the mare. If the mare and foal are not captured during that removal year, both mare and foal would be moved into Tier 1 for the next capture and removal year.

Multiple trap sites would be used to capture the wild horses. The traps would consist of portable panel pens set up either at water sources or areas frequented by wild horses. Hay or other attractants (such as mineral or processed cubes i.e cake) would be used to lure horses to the area. Prior to any wild horses being captured, the trap or bait may be in place to accustom wild horses to their presence. When a band of wild horses or individuals enters the trap, the gate would be closed by BLM or other government personnel. Any animals not identified for removal would be released back onto the range. When an animal is captured and must be held for the day before being transported to Britton Springs, the animal(s) would be provided with feed and water at the trap site. Trap sites would most likely be placed at Sykes Spring, Layout Creek, Bad Pass Seep, Near Krueger Pond, and with clearance from NPS, on Mustang Flat and Crooked Creek Bay. Other sites such as Cottonwood Spring may be used as necessary based upon flow and success of the operation in an adaptive management manner. Other areas would be used as opportunities allow such as Sykes Ridge road. Water sources such as guzzlers and springs may be temporarily closed to encourage horses to move to an area or other water source where they can be safely trapped. If animals show signs of water deprivation and don't move, waters will be re-opened. Animals identified for removal would be sorted at the trap site and transported to Britton Springs Administrative Site and corrals with horse or stock trailers pulled behind trucks.

Excess wild horses would be prepared for adoption at the Britton Springs Corrals. This would entail veterinarian examination and care, permanent freezemark placed on the left side of the neck, vaccinations, feed and care, and gelding. The animals would be offered for adoption at Britton Springs Corrals or sent to training and/or offered on the internet for pick-up at Britton Springs.

Appropriate site-specific clearance and review for cultural resources and species of concern would be conducted at each trap site prior to set up (if an area is not previously utilized or is without developments on site). The trap sites would be located in previously disturbed areas. The areas would be monitored for noxious weeds over the next several years. All sites would be assessed for post gather reseeding. All capture and handling activities (including capture site selection) would be conducted in accordance with the standard operating procedures (SOPs) found in Appendix 1.

TABLE 1 – TIER REMOVAL PROPOSED ACTION				
Herd Health Removals	**Tier 1**	**Tier 2**	**Tier 3**	**Not Considered for Removal**
201407 Oak (m) suspected of being inbred. Tier 1 in 2015.	201402 Orlando (m) 6th foal of Greta. Tier 1 in 2015.	201504 Pele (f) 2nd foal of Fool's Gold.	201401 Oracle (m) 2nd foal of Hataalii, first foal removed.	201412 Oro (m) 1st foal of Maia.
201505 Parry (m) suspected of being inbred.	201405 Oglala (m) 2nd foal of Icra. Tier 1 in 2015.	201701 Rigel Starr (f) 2nd foal of Nova.	201419 Orielle (f) 2nd foal of Inocentes, first foal removed.	201416 Oklahoma (m) 1st foal of Lariat.
	201410 Outlaw Lady (f) 3rd foal of Helenium.		201512 Patriot (m) 2nd foal of Jacinta, first foal removed.	201418 Oceana (f) 1st foal of Galadriel.
	201411 Okomi (m) 6th foal of Firestorm.		201601 Quasar (m) 2nd foal of Kitalpha, age class to remain.	201420 Okiotak (m) 1st foal of Ketchikan.
	201501 Phantom (f) 3rd foal of Icara.		201602 Quanah (m) 4th foal of Halcyon, age class to remain.	201509 Petite Colour (f) 1st foal of Kohl.
	201502 Prospera (f) 5th foal of Fiasco.		201606 Quintana (f) 7th foal of Feldspar, age class to remain.	201510 Prima (f) 1st foal of Nova.
	201506 Cloud's Pride (m) 6th foal of Feldspar.		201608 Quahneah (f) 13th foal of Washakie, age class to remain.	201513 Pax (m) 1st foal of La Nina.
	201507 Petra (f) 5th foal of Galena.		201705 Rio (m) 3rd foal of Jacinta, age class to remain.	201515 Pilar (f) 1st foal of La Brava.
	201508 Banjo Paterson (m) 5th foal of Gabrielle.		201706 Morning Reverie (f) 4th foal of Hataalii, age class to remain.	201708 Ryden (m) 1st foal of Jasmine.
	201511 Pegasus (f) 11th foal of Ireland.			201709 Ruby (f) 1st foal of Juniper.
	201514 Penn (f) 3rd foal of Audobon.			
	2001603 Quintasket (f) 4th foal of Helenium.			
	201604 Quaid (m) 7th foal of Greta.			
	201607 Quillan (f) 12th foal of Ireland.			

The BLM also proposes a fertility control prescription that is supported by the HMAP in managing the herd within AML. The proposed fertility control prescription is a combination of other fertility control prescriptions that have been used in the PMWHR and is a continuation of the population management objectives found in the HMAP. The proposed fertility control prescription would treat mares ages 2 and 3 with ZonaStat-H. Young mares in the one year old age class becoming two year olds could begin primer treatments in the autumn at 18 months of

age. Mares ages 4 and older would not receive a treatment until after they have successfully foaled twice. Once a mare has received six consecutive treatments she would be removed from the fertility control treatment unless she foals again, in which case she would then receive a minimum of three more fertility control treatments. Mares would be approached on foot or possibly baited in (not trapped) or by vehicle to be treated with ZonaStat-H through remote darting applications. Mares that have had all of their offspring removed or are proposed to be removed due to herd health would be allowed to foal and have a foal remain as their representation. This action would begin in 2018 and remain in effect until conditions warrant a change.

BLMs Use of Contraception in Wild Horse Management

BLM has identified fertility control as a method that could be used to protect rangeland ecosystem health and to reduce the frequency of wild horse and wild burro gathers and removals. Expanding the use of population growth suppression to slow population growth rates and reduce the number of animals removed from the range and sent to off-range pastures (ORPs) is a BLM priority. The WFRHBA of 1971 specifically provides for contraception and sterilization (section 3.b.1). No finding of excess animals is required for BLM to pursue contraception in wild horses or wild burros. The following literature review is intended to summarize what is known and what is not known about potential effects of treating mares with porcine zona pellucida (PZP) vaccine. As noted below, some negative consequences of vaccination are possible. PZP vaccines are administered only to females.

Contraception has been shown to be a cost-effective and humane treatment to slow increases in wild horse populations or, when used with other techniques, to reduce horse population size (Bartholow 2004, de Seve and Boyles-Griffin 2013). All fertility control methods in wild animals are associated with potential risks and benefits, including effects of handling, frequency of handling, physiological effects, behavioral effects, and reduced population growth rates (Hampton et al. 2015). Contraception by itself does not remove excess horses from an HMA's population, so if a wild horse population is in excess of AML, then contraception alone would result in some continuing environmental effects of horse overpopulation. Successful contraception reduces future reproduction. Limiting future population increases of horses could limit increases in environmental damage from higher densities of horses than currently exist. Horses are long-lived, potentially reaching 20 years of age or more in the wild and, if the population is above AML, treated horses returned to the HMA may continue exerting negative environmental effects, as described in section 3.2, throughout their life span. In contrast, if horses above AML are removed when horses are gathered, that leads to an immediate decrease in the severity of ongoing detrimental environmental effects to rangeland water, soils and vegetation.

Successful contraception would be expected to reduce the frequency of horse gather activities, as well as wild horse management costs to taxpayers. Bartholow (2007) concluded that the application of 2 or 3-year contraceptives to wild mares could reduce operational costs in a project area by 12-20%, or up to 30% in carefully planned population management programs. He also concluded that contraceptive treatment would likely reduce the number of horses that must be removed in total, with associated cost reductions in the number of adoptions and total holding

costs. If applying contraception to horses requires capturing and handling horses, the risks and costs associated with capture and handling of horses may be comparable to those of gathering for removal, but with expectedly lower adoption and long-term holding costs. Population suppression becomes less expensive if fertility control is long-lasting (Hobbs et al. 2000). Although contraceptive treatments may be associated with a number of potential physiological, behavioral, demographic, and genetic effects, detailed below, those concerns do not generally outweigh the potential benefits of using contraceptive treatments in situations where it is a management goal to reduce population growth rates (Garrott and Oli 2013).

Whether to use or not use this method to reduce population growth rates in wild horses is a decision that must be made considering those effects as well as the potential negative consequences of inaction, such as continued overpopulation and rangeland health degradation.

2.2 Alternative A

Alternative A would consist of an annual incremental gather of excess wild horses by selectively removing wild horses in accordance with the PMWHR HMAP, beginning in 2018. The herd would be evaluated to determine which excess animals would be removed annually. The gather would begin in 2018 with up to 20 excess wild horses removed. The following years as the herd is monitored annually and classified (which is done concurrent with fertility treatments and typically completed by June) the death loss and recruitment would be compared. The out years after the 2018 gather would concentrate on one year olds for excess animals to be removed. The excess animals removed would consist of any animals that weren't captured the previous year, and one year olds that were born to mares under PZP treatments. This would continue until recruitment and death loss balance and forage use objectives were being met. The primary window for gather operations would be summer, however as opportunities arise it could occur any time of year on a limited basis. All other actions in Alternative A would be the same as same as the proposed action except non-excess animals could be relocated to other areas of the range for genetic exchange.

TABLE 2 –REMOVAL ALTERNAITVE A
Removal List
201402 Orlando (m) 6th foal of Greta. Tier 1 in 2015.
201405 Oglala (m) 2nd foal of Icra. Tier 1 in 2015.
201407 Oak (m) suspected of being inbred. Tier 1 in 2015.
201411 Okomi (m) 6th foal of Firestorm, born to mare on PZP.
201412 Oro (m) 1st foal of Maia, born to mare on PZP.
201416 Oklahoma (m) 1st foal of Lariat, born to mare on PZP.
201420 Okiotak (m) 1st foal of Ketchikan, born to mare on PZP.
201510 Prima (f) 1st foal of Nova, born to mare on PZP.
201513 Pax (m) 1st foal of La Nina, born to mare on PZP.
201505 Parry (m) suspected of being inbred, born to mare on PZP.
201509 Petite Colour (f) 1st foal of Kohl, born to mare on PZP.
201511 Pegasus (f) 11th foal of Ireland, born to mare on PZP.
201514 Penn (f) 3rd foal of Audobon, born to mare on PZP.
201515 Pilar (f) 1st foal of La Brava, born to mare on PZP.
201601 Quasar (m) 2nd foal of Kitalpha, born to mare on PZP.
201602 Quanah (m) 4th foal of Halcyon, born to mare on PZP.
2001603 Quintasket (f) 4th foal of Helenium, born to mare on PZP.
201606 Quintana (f) 7th foal of Feldspar, born to mare on PZP.
201607 Quillan (f) 12th foal of Ireland, born to mare on PZP.
201608 Quahneah (f) 13th foal of Washakie, born to mare on PZP.
201701 Rigel Starr (f) 2nd foal of Nova, born to mare on PZP.

This alternative would not make any changes to the existing 2015 fertility control prescription.

2.3 No Action Alternative

The no action alternative is required by the National Environmental Policy Act (NEPA) to provide a baseline for impact analysis.

Under this alternative, a gather to remove excess wild horses would not occur this year and fertility control would continue. Collection of herd and range monitoring data would continue.

2.4 Alternative Considered but Eliminated From Further Analysis

2.4.1 No Removals and No Fertility Control

Under this alternative no population management would occur within the PMWHR. Wild horses would be allowed to reproduce until a population crash controls their numbers. Under this alternative there would be no way to ensure any population outcome other than after the population crash occurs as new bottleneck is created for the remaining animals. Wild horses would be allowed to exhaust all resources, multiple use relationships would be ignored, and the public could observe horses in lower body conditon until a crash occurs and individuals perish.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment and analyzes impacts to the components of the human environment either affected or potentially affected by the Proposed Action, Alternative A and the No Action alternative.

The 2009 PMWHR EA and HMAP identified and analyzed the effects to the environment. For a complete description of the affected environment and environmental consequences, see pages 44-85 of the Pryor Mountain Wild Horse Range/Territory Environmental Assessment and Herd Management Area Plan May 2009.

For this EA the impact analysis for the Proposed Action and Alternative A are designed to only analyze potential impacts associated with conducting or not conducting a gather(s) and modifying existing fertility control prescriptions.

3.1 Critical Elements of the Human Environment

Certain resources are protected by specific laws, regulations, or policies (e.g., Executive Orders). BLM refers to these resources as "Critical Elements of the Human Environment" and addresses them in all EAs. Those Critical Elements that are identified below as being present and potentially affected would be analyzed further in this chapter. The affected environment and environmental impacts are described for all resources, including Critical Elements, which are potentially affected by the proposed action.

TABLE 3 – CRITICAL ELEMENTS		
Determi-nation*	**Resource**	**Rationale for Determination**
NI	Air Quality	The proposed action would have no impact on these values.
NI	Areas of Critical Environmental Concern	The East Pryor Mountains were designated as an ACEC in March 1999 to conserve the area for wild horses, paleontological values, recreational use, and fish and wildlife habitat The proposed action should have no impact on these values.
PI	Cultural Resources	The proposed action could impact these resources; however, a cultural survey would be conducted on any trap sites not previously inventoried.
NP	Environmental Justice	The proposed action would have no effect on minority or economically disadvantaged people or populations.
NP	Farmlands (Prime or Unique)	There are no prime or unique farmlands within the area.
NP	Floodplains	There are no floodplains within the area.
PI	Invasive, Non-native Species	The proposed action has the potential to create soil disturbance allowing for establishment of invasive or noxious plants.
NP	Native American Religious Concerns	The proposed action would have no impact on these values.
PI	Threatened, Endangered or Candidate Plant Species	Areas with these plants would be avoided or trap sites modified.
NP	Threatened, Endangered or Candidate Animal Species	The proposed action would have no impact on these values, there are no T, E or C animal species or critical habitats found within the project area.
NP	Wastes (hazardous or solid)	There are no hazardous or solid wastes located within the planning area.
NP	Water Quality (drinking/ground)	The proposed action would have no effect on ground or drinking water.
NI	Wetlands/Riparian Zones	The proposed action would have no impact on these values as no trapping would occur within riparian areas.
NP	Wild and Scenic Rivers	There are no Wild and Scenic Rivers located within the project area.
PI	Wilderness	The BLM is prohibited from taking any actions within or adjacent to Wilderness Study Areas that would impair the wilderness characteristics or prevent an area from potentially being designated Wilderness. Actions could have minor, short-term impacts on wilderness attributes but the effects would not be irreversible or irretrievable.

*
NP = not present in the area impacted by the proposed or alternative actions
NI = present, but not affected to a degree that detailed analysis is required
PI = present with potential for impact.

3.2 Wild Horses

Affected Environment

The affected environment is described and incorporated by reference from the 2009 PMWHR EA and HMAP and the tiered Fertility Control and Capture and Removal EAs of 2015 (Note: please see definition of "by reference" on page 4). In addition to the affected environment in the HMAP since 2009, the population of wild horses has continued to increase. See Appendix 3.

The current demographics of the herd are shown in Appendix 5. This includes all ages, disposition and fertility control treatments. In addition, the affected environment for Alternative A is the entire herd and any recruitment in the years following 2018.

Spanish Phenotype (as defined in HMAP) animals (over 3 yrs. old) are still on the range post 2012 and 2015 gathers, the Spanish characteristics are already retained in the herd. Table 2 places these wild horses into tiers for better identification for removal considerations. Tier one is composed of wild horses whose removal would maintain the objectives for the herd and include wild horses that are the third foals (or more) of a given mare and Tier 1 wild horses that were identified and not captured in 2015. Tier two is composed of animals whose removal would also meet the objectives for the herd, and includes wild horses that are the second foals of a given mare (one foal has to have lived past the age of 1) if the number of wild horses within the PMWHR exceeds AML by 5%. Tier one and two horses would be the focus for removal when wild horse numbers exceed AML by 5% or more. Tier three are animals whose removal may make it more difficult to meet herd objectives in the future. Wild horses from Tier 3 would only be removed if one and two tier wild horses are not located where they can be captured or cannot be captured in sufficient numbers after gather operations are approaching the end of the season or for health concerns.

Environmental Impacts

Assumptions for analysis of the Proposed Action: This impact analysis for the proposed action assumes that a 100 percent capture rate would be attained for removal purposes. Only the impacts to wild horses from gathering and fertility control are analyzed as all other population impacts have been analyzed in the 2009 HMAP and are incorporated by reference. This section only analyzes the impacts from conducting a bait/water and foot herding gather as the 2009 PMWHR EA and HMAP already disclosed the impacts of management utilizing a combination of methods including removals. Population modeling occurred within the HMAP and is incorporated by reference. The model shows the effects of managing for 90-120 wild horses within the 2009 HMAP won't cause a population "crash".

The proposed action would utilize herd characteristic objectives and the removal considerations from the 2009 HMAP (page 27) when removing individual animals to the most feasible extent possible. Animals within the ages 1-4 year olds would be the target population. Herd characteristic objectives have previously been analyzed in the 2009 HMAP and are incorporated by reference. The Standard Operating Procedures for Gather Operations (Appendix 1) for handling are incorporated as part of the Proposed Action and Alternative A.

Assumptions for analysis: ZonaStat-H is the same as PZP for terminology used throughout the analysis. This impact analysis assumes that observed treatment rates, non-responding mares and two year olds would produce at least 6 unplanned foals per year. Logistic limitations would remain the same. ZonaStat-H is at least 90% effective in preventing conception after a mare has been given a booster prior to estrous. The long term average death loss for the herd is six individuals per year and this would remain the same. Historical long term foal survival rates of 60% would continue however recently survivor rates of foals have increased with PZP. The Standard Operating Procedures (Appendix 2) for use and application of PZP are incorporated as part of the proposed action and no action. Impacts to the wild horses take the form of direct and indirect impacts and may occur on either the individual or the population as a whole.

Proposed Action – Under the proposed action, excess wild horses would be captured and removed from the PMWHR utilizing a combination of bait and water trapping. Herding (on foot or horseback) could be used in conjunction with the two techniques but not for actual capture off of horseback, rather for moving congregated animals away from trap sites, herding animals toward trap sites, or locating animals. Traps would be constructed of portable steel panels typically consisting of 15 to 25 twelve foot long by six foot high panels placed either around a water trough (water trapping) or in an area with regular wild horse use for bait trapping. The traps would be constructed in a manner that allows wild horses to initially move freely through them until they are accustomed to their presence. The traps would also have an alley attached for loading captured excess wild horses onto horse/stock trailers and pulled behind appropriate motorized vehicles

Prior to capture, trap sites could be baited before panels are set up to allow for wild horses to become accustom to coming into an area for feed, salt or other attractant. Once the panels are set up, two sides would be left open to allow wild horses to walk through or not completely closed with one side open. When trapping occurs one side would be closed off and wild horses would only be allowed to enter one side. That side would have a panel or a gate that would be closed by personnel at the trap as a wild horse identified for removal enters, or a band with a member(s) in it identified for removal enters. Once captured the wild horse(s) identified as excess would be sorted from other wild horses and either immediately loaded in a horse/stock trailer and transported to Britton Springs, or sorted into the holding pen to await transport. Excess wild horses would be prepared for adoption at the Britton Springs Corrals. This would entail veterinarian examination and care, permanent freezemark placed on the left side of the neck, vaccinations, worming, feed and care, and males gelded (excluding any foals). The animals would be offered for adoption to qualified applicants at Britton Springs Corrals or on the internet for pickup at Britton Springs a later time or placed into training for later adoption.

Water trapping would occur in the low elevation areas of the wild horse range. Water traps would be designed similar to a bait trap, except only one entrance would be in place with the initial panel setup. A water trap would leave a much wider opening initially to allow wild horses to enter and drink without creating a situation where the horses are unwilling to drink due to the presence of the panels. As the wild horses become more accustom to the panels, the mouth or opening would be slowly closed until there is only a gate or one panel for an opening. Once an identified animal is inside the trap, the gate would be closed by personnel tending the trap. After

capture, the impacts would be the same as described above for a bait trap. In order to concentrate wild horses in the low country and provide for better safety and faster capture the troughs at Cottonwood Spring, Little Sykes Springs, guzzlers, and portions of layout creek could be temporarily closed to wild horse use with panels to move animals to other water sources for capture. If water deprivation due to a lack of movement by wild horses to other waters is detected the waters would be re-opened.

During the initial setup, game cameras may be placed on each trap to help monitor wild horse use and determine when to begin capture operations. The use of a saddle horse or horses to locate wild horses (especially in the low country) and/or herd wild horses away from bait sites would be a minimally used tool. Based upon past experience by BLM personnel through monitoring on horseback or herding animals back to the PMWHR, wild horses are responsive to saddle horses but not agitated nor flighty. This tool would be utilized as needed.

Impacts to individual animals could occur as a result of stress associated with the gather, capture, processing, and transportation of animals. The intensity of these impacts would vary by individual and would be indicated by behaviors ranging from nervous agitation to physical distress. Sometimes hitting panels or trailers or interaction with other wild horses in a confined space can result in bruising scrapes or cuts. Mortality to individuals from this impact is infrequent but can occur. Serious injury (such as broken legs or neck) that requires euthanasia from these actions can occur but is rare. A wild horse hasn't died or been euthanized due to gather activities since 1994 on the PMWHR. Other impacts to individual wild horses include separation of members of individual bands and removal of animals from the population.

Population-wide impacts could occur during or immediately following implementation of the proposed action. Potential impacts include the displacement of bands during capture and the associated re-dispersal, modification of herd demographics (age and sex ratios), temporary separation of members of individual bands of wild horses, reestablishment of bands following release, bands moving to different waters and the removal of animals from the population. With the exception of changes to herd demographics (removed individuals), direct population-wide impacts would be temporary in nature with most, if not all, impacts disappearing with release.

Indirect impacts can occur to wild horses after the initial stress event and could include increased social displacement or increased conflict between studs. These impacts are known to occur intermittently during wild horse gather operations. Traumatic injuries could occur and typically involve biting and/or kicking bruises.

Less competition for forage and water resources would reduce stress and promote healthier animals. The proposed action would also allow for the continued collection of information on herd characteristics, determination of herd health through direct examination of animals, and collect genetic samples for monitoring of genetic variation. The action would make progress towards bringing the population close to the AML.

The proposed action is based upon observed outcomes of the 2011 and 2015 fertility control treatments prescription, and designed to implement the 2009 PMWHR HMAP and continue until changes occur that require a new analysis and reduce the need for large removals. The use

fertility control would consist of the administration of remote darting of ZonaStat-H applied in the one year liquid dose mixed with either Freund's Modified Adjuvant for the primer or Freund's Incomplete Adjuvant to render mares treated. This fertility control modification is designed to limit herd growth, while still ensuring the continuation of the herd. Mares ages 2, and 3 would be treated. Young mares in the one year old age class becoming two year olds could begin primer treatments in the autumn at 18 months of age. Mares ages 4 and older would not receive a treatment until after they have successfully foaled twice. Once a mares has received six consecutive treatments she would be removed from the fertility control treatment unless she foals again, she would then receive a minimum of 3 more fertility control treatments. Any mare within a treatment age or meeting a threshold could be treated any time of year.

The proposed action incorporates proven Standard Operating Procedures for Fertility Control (Appendix 2) which represent the "best methods" for ensuring quality results, minimizing risks and reducing impacts associated with this activity. All activity would be carried out in accordance with the use of ZonaStat-H label. Protocols have been specifically developed for remote-delivery techniques of the fertility control vaccine.

Porcine Zona Pellucida (PZP) Vaccine

PZP vaccines have been used on dozens of horse herds by the National Park Service, US Forest Service, Bureau of Land Management, and Native American tribes and its use is approved for free-ranging wild horse herds. Taking into consideration available literature on the subject, the National Research Council concluded in their 2013 report that PZP was one of the preferable available methods for contraception in wild horses and burros (NRC 2013). PZP use can reduce or eliminate the need for gathers and removals (Turner et al. 1997). PZP vaccines meet most of the criteria that the National Research Council (2013) used to identify promising fertility control methods, in terms of delivery method, availability, efficacy, and side effects. It has been used extensively in wild horses (NRC 2013), and in feral burros on Caribbean islands (Turner et al. 1996, French et al. 2017). PZP is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and is produced as ZonaStat-H, an EPA-registered commercial product (EPA 2012, SCC 2015), or as PZP-22, which is a formulation of PZP in polymer pellets that can lead to a longer immune response (Turner et al. 2002, Rutberg et al. 2017). 'Native' PZP proteins can be purified from pig ovaries (Liu et al. 1989). Recombinant ZP proteins may be produced with molecular techniques (Gupta and Minhas 2017, Joonè et al. 2017a). It can easily be remotely administered in the field in cases where mares are relatively approachable. Use of remotely delivered (dart-delivered) vaccine is generally limited to populations where individual animals can be accurately identified and repeatedly approached within 50 m (BLM 2010).

Under the Proposed Action, the BLM would return to the PMWHR as needed to re-apply PZP-ZonaStat-H and initiate new treatments in order to maintain contraceptive effectiveness in controlling population growth rates. Both forms of PZP can safely be reapplied as necessary to control the population growth rate. Even with repeated booster treatments of PZP, it is expected that most mares would return to fertility, though some mares treated repeatedly may not (see *PZP Direct Effects*, below). Once the population is at AML and population growth seems to be stabilized, BLM could use population planning software (WinEquus II, currently in development by USGS Fort Collins Science Center) to determine the required frequency of re-treating mares with PZP.

The BLM currently uses two PZP formulations for fertility control of wild horse mares, ZonaStat-H (PZP Native) and PZP-22. As other formulations are approved for use by BLM, they may be applied through future gathers or darting activities. For the purpose of this management plan, field or remote darting refers to applying the vaccine using a dart. Darting can be implemented when animals are gathered into corrals or opportunistically by applicators near water sources or along main trails out on the range. Blinds may be used to camouflage applicators to allow efficient treatment of as many mares as possible. PZP can also be applied via hand injections using plastic syringes when animals are gathered into corrals and chutes. In keeping with the EPA registration for ZonaStat-H (EPA 2012; reg. no. 86833-1), certification through the Science and Conservation Center in Billings Montana is required to apply that vaccine to equids.

Native PZP (or currently most effective formulation) would be administered by PZP certified and trained applicators in the one year liquid dose inoculations by field darting the mares. Prior to actually darting, an inventory of the wild horses would be conducted. This would include a list of marked horses and / or a photo catalog with descriptions of the animals to assist in identifying which animals have been darted and which need to be darted.

When applying native PZP (i.e., ZonaStat-H), first the primer with modified Freund's Complete adjuvant is given and then the booster with Freund's Incomplete adjuvant is given 2-6 weeks later. Preferably, the timing of the booster dose is at least 1-2 weeks prior to the onset of breeding activity. Following the initial 2 inoculations, only annual boosters are required. For maximum effectiveness, PZP would be administered within the December to February timeframe. The procedures to be followed for application of PZP are detailed in *Appendix 2 Standard Operating Procedures for Population-level Porcine Zona Pellucida Fertility Control Treatments.*

PZP Direct Effects

The historically accepted hypothesis explaining PZP vaccine effectiveness posits that when injected as an antigen in vaccines, PZP causes the mare's immune system to produce antibodies that are specific to zona pellucida proteins on the surface of that mare's eggs. The antibodies bind to the mare's eggs surface proteins (Liu et al. 1989), and effectively block sperm binding and fertilization (Zoo Montana, 2000). Because treated mares do not become pregnant but other ovarian functions remain generally unchanged, PZP can cause a mare to continue having regular estrus cycles throughout the breeding season. More recent observations support a complementary hypothesis, which posits that PZP vaccination causes reductions in ovary size and function (Mask et al. 2015, Joonè et al. 2017b, Joonè et al. 2017c).

Research has demonstrated that contraceptive efficacy of an injected liquid PZP vaccine, such as ZonaStat-H, is approximately 90% or more for mares treated twice in one year (Turner and Kirkpatrick 2002, Turner et al. 2008). High contraceptive rates of 90% or more can be maintained in horses that are boostered annually (Kirkpatrick et al. 1992). Approximately 60% to 85% of mares are successfully contracepted for one year when treated simultaneously with a liquid primer and PZP-22 pellets (Rutberg et al. 2017). Application of PZP for fertility control would reduce fertility in a large percentage of mares for at least one year (Ransom et al. 2011).

The fraction of mares treated in a herd can have a large effect on the realized change in growth rate due to PZP contraception, with an extremely high portion of mares required to be treated to lead prevent population-level growth (e.g., Turner and Kirkpatrick 2002). Additionally, some mares may not respond to the fertility control vaccine, but instead will continue to foal normally.

Reversibility and Effects on Ovaries

In most cases, PZP contraception appears to be temporary and reversible, with most treated mares returning to fertility over time (Kirkpatrick and Turner 2002). The NRC (2013) criterion by which PZP is not optimal for wild horse contraception was duration. The ZonaStat-H formulation of the vaccine tends to confer only one year of efficacy per dose. Some studies have found that a PZP vaccine in long-lasting pellets (PZP-22) can confer multiple years of contraception (Turner et al. 2007), particularly when boostered with subsequent PZP vaccination (Rutberg et al. 2017). Other trial data, though, indicate that the pelleted vaccine may only be effective for one year (J. Turner, University of Toledo, Personal Communication).

The purposes of applying PZP treatment is to prevent mares from conceiving foals, but BLM acknowledges that long-term infertility, or permanent sterility, could be a result for some number of wild horses receiving PZP vaccinations. The rate of long-term or permanent sterility following vaccinations with PZP is hard to predict for individual horses, but that outcome appears to increase in likelihood as the number of doses increases (Kirkpatrick and Turner 2002). Permanent sterility for mares treated consecutively 5-7 years was observed by Nuñez et al. (2010, 2017). In a graduate thesis, Knight (2014) suggested that repeated treatment with as few as three to four years of PZP treatment may lead to longer-term sterility, and that sterility may result from PZP treatment before puberty. Repeated treatment with PZP led long-term infertility in Przewalski's horses receiving as few as one PZP booster dose (Feh 2012). If some number of mares become sterile as a result of PZP treatment, that potential result would be consistent with the contraceptive purpose of applying the vaccine.

In some mares, PZP vaccination may cause direct effects on ovaries (Gray and Cameron 2010, Joonè et al. 2017b, Joonè et al. 2017c). Joonè et al. (2017a) noted reversible effects on ovaries in mares treated with one primer dose and booster dose. Joonè et al. (2017c) documented decreased anti-Mullerian hormone (AMH) levels in mares treated with native or recombinant PZP vaccines; AMH levels are thought to be an indicator of ovarian function. Bechert et al. (2013) found that ovarian function was affected by the SpayVac PZP vaccination, but that there were no effects on other organ systems. Mask et al. (2015) demonstrated that equine antibodies that resulted from SpayVac immunization could bind to oocytes, ZP proteins, follicular tissues, and ovarian tissues. It is possible that result is specific to the immune response to SpayVac, which may have lower PZP purity than ZonaStat or PZP-22 (Hall et al. 2016). However, in studies with native ZP proteins and recombinant ZP proteins, Joonè et al. (2017a) found transient effects on ovaries after PZP vaccination in some treated mares; normal estrus cycling had resumed 10 months after the last treatment. SpayVac is a patented formulation of PZP in liposomes that can lead to multiple years of infertility (Roelle et al. 2017) but which is not reliably available for BLM to use at this time. Kirkpatrick et al. (1992) noted effects on horse ovaries after three years of treatment with PZP. Observations at Assateague Island National Seashore indicate that the more times a mare is consecutively treated, the longer the time lag before fertility returns, but that even mares treated 7 consecutive years did eventually return to ovulation (Kirkpatrick and

Turner 2002). Other studies have reported that continued applications of PZP may result in decreased estrogen levels (Kirkpatrick et al. 1992) but that decrease was not biologically significant, as ovulation remained similar between treated and untreated mares (Powell and Monfort 2001). Permanent sterility for mares treated consecutively 5-7 years was observed by Nuñez et al. (2010, 2017). Bagavant et al. (2003) demonstrated T-cell clusters on ovaries, but no loss of ovarian function after ZP protein immunization in macaques. Skinner et al. (1984) raised concerns about PZP effects on ovaries, based on their study in laboratory rabbits, as did Kaur and Prabha (2014), though neither paper was a study of PZP effects in equids.

Effects on Existing Pregnancies, Foals, and Birth Phenology

If a mare is already pregnant, the PZP vaccine has not been shown to affect normal development of the fetus or foal, or the hormonal health of the mare with relation to pregnancy (Kirkpatrick and Turner 2003). It is possible that there may be transitory effects on foals born to mares or jennies treated with PZP. In mice, Sacco et al. (1981) found that antibodies specific to PZP can pass from mother mouse to pup via the placenta or colostrum, but that did not apparently cause any innate immune response in the offspring: the level of those antibodies were undetectable by 116 days after birth. There was no indication in that study that the fertility or ovarian function of those mouse pups was compromised, nor is BLM aware of any such results in horses or burros. Unsubstantiated speculative connections between PZP treatment and foal stealing has not been published in a peer-reviewed study and thus cannot be verified. Similarly, although Nettles (1997) noted reported stillbirths after PZP treatments in cynomolgus monkeys, those results have not been observed in equids despite extensive use.

On-range observations from 20 years of application to wild horses indicate that PZP application in wild mares does not generally cause mares to give birth to foals out of season or late in the year (Kirkpatrick and Turner 2003). Nuñez's (2010) research showed that a small number of mares that had previously been treated with PZP foaled later than untreated mares and expressed the concern that this late foaling "may" impact foal survivorship and decrease band stability, or that higher levels of attention from stallions on PZP-treated mares might harm those mares. However, that paper provided no evidence that such impacts on foal survival or mare well-being actually occurred. Rubenstein (1981) called attention to a number of unique ecological features of horse herds on Atlantic barrier islands, which calls into question whether inferences drawn from island herds can be applied to western wild horse herds. Ransom et al. (2013), though, identified a potential shift in reproductive timing as a possible drawback to prolonged treatment with PZP, stating that treated mares foaled on average 31 days later than non-treated mares. Results from Ransom et al. (2013), however, showed that over 81% of the documented births in this study were between March 1 and June 21, i.e., within the normal spring season. Ransom et al. (2013) advised that managers should consider carefully before using PZP in small refugia or rare species. Wild horses and burros managed by BLM do not generally occur in isolated refugia, nor are they rare species. Moreover, an effect of shifting birth phenology was not observed uniformly: in two of three PZP-treated wild horse populations studied by Ransom et al. (2013), foaling season of treated mares extended three weeks and 3.5 months, respectively, beyond that of untreated mares. In the other population, the treated mares foaled within the same time period as the untreated mares. Furthermore, Ransom et al. (2013) found no negative impacts on foal survival even with an extended birthing season. If there are shifts in birth phenology, though, it is reasonable to assume that some negative effects on foal survival might result from particularly

severe weather events.

Effects of Marking and Injection

Standard practices for PZP treatment require that immunocontraceptive-treated animals be readily identifiable, either via brand marks or unique coloration (BLM 2010).

Most mares recover from darting quickly, and none are expected to suffer serious long term effects from the fertility control injections, other than the direct consequence of becoming temporarily infertile. Injection site reactions associated with fertility control treatments are possible in treated mares (Roelle and Ransom 2009, Bechert et al. 2013, French et al. 2017), but swelling or local reactions at the injection site are expected to be minor in nature. Use of remotely delivered, 1-year PZP is generally limited to populations where individual animals can be accurately identified and repeatedly approached. The dart-delivered formulation produced injection-site reactions of varying intensity, though none of the observed reactions appeared debilitating to the animals (Roelle and Ransom 2009). Joonè et al. (2017a) found that injection site reactions had healed in most mares within 3 months after the booster dose, and that they did not affect movement or cause fever. The longer term nodules observed did not appear to change any animal's range of movement or locomotor patterns and in most cases did not appear to differ in magnitude from naturally occurring injuries or scars.

Indirect Effects

One expected long-term, indirect effect on wild horses treated with fertility control would be an improvement in their overall health (Turner and Kirkpatrick 2002). Many treated mares would not experience the biological stress of reproduction, foaling and lactation as frequently as untreated mares. The observable measure of improved health is higher body condition scores (Nuñez et al. 2010). After a treated mare returns to fertility, her future foals would be expected to be healthier overall, and would benefit from improved nutritional quality in the mare's milk. This is particularly to be expected if there is an improvement in rangeland forage quality at the same time, due to reduced wild horse population size. Past application of fertility control has shown that mares' overall health and body condition remains improved even after fertility resumes. PZP treatment may increase mare survival rates, leading to longer potential lifespan (Turner and Kirkpatrick 2002, Ransom et al. 2014a). To the extent that this happens, changes in lifespan and decreased foaling rates could combine to cause changes in overall age structure in a treated herd (i.e., Turner and Kirkpatrick 2002, Roelle et al. 2010), with a greater prevalence of older mares in the herd (Gross 2000). Observations of mares treated in past gathers showed that many of the treated mares were larger than, maintained higher body condition than, and had larger healthy foals than untreated mares.

Following resumption of fertility, the proportion of mares that conceive and foal could be increased due to their increased fitness; this has been called a 'rebound effect.' Elevated fertility rates have been observed after horse gathers and removals (Kirkpatrick and Turner 1991). More research is needed to document and quantify these hypothesized effects in PZP-treated herds. If repeated contraceptive treatment leads to a prolonged contraceptive effect, then that may minimize or delay the hypothesized rebound effect.

Because successful fertility control would reduce foaling rates and population growth rates, another indirect effect should be to reduce the number of wild horses that have to be removed over time to achieve and maintain the established AML. Contraception would be expected to lead to a relative increase in the fraction of older animals in the herd. Reducing the numbers of wild horses that would have to be removed in future gathers could allow for removal of younger, more easily adoptable excess wild horses, and thereby could eliminate the need to send additional excess horses from this area to off-range holding corrals or pastures for long-term holding. Among mares in the herd that remain fertile, a high level of physical health and future reproductive success would be expected because reduced population sizes should lead to more availability of water and forage resources per capita.

Reduced population growth rates and smaller population sizes could also allow for continued and increased environmental improvements to range conditions within the project area, which would have long-term benefits to wild horse habitat quality. As the population nears or is maintained at the level necessary to achieve a thriving natural ecological balance, vegetation resources would be expected to recover, improving the forage available to wild horses and wildlife throughout PMWHR. With rangeland conditions more closely approaching a thriving natural ecological balance, and with a less concentrated distribution of wild horses across the HMA, there should also be less trailing and concentrated use of water sources. Lower population density would be expected to lead to reduced competition among wild horses using the water sources, and less fighting among horses accessing water sources. Water quality and quantity would continue to improve to the benefit of all rangeland users including wild horses. Wild horses would also have to travel less distance back and forth between water and desirable foraging areas. Should PZP booster treatment continue into the future, the chronic cycle of overpopulation and large gathers and removals would no longer occur, but instead a consistent cycle of balance and stability would ensue, resulting in continued improvement of overall habitat conditions and animal health. While it is conceivable that widespread and continued treatment with PZP could reduce the birth rates of the population to such a point that birth is consistently below mortality, that outcome is not likely unless a very high fraction of the mares present are all treated in almost every year.

Behavioral Effects

The NRC report (2013) noted that all fertility suppression has effects on mare behavior, mostly as a result of the lack of pregnancy and foaling, and concluded that PZP was a good choice for use in the program. The result that PZP-treated mares may continue estrus cycles throughout the breeding season can lead to behavioral differences (as discussed below), when compared to mares that are fertile. Such behavioral differences should be considered as potential consequences of successful contraception.

Ransom and Cade (2009) delineate behaviors that can be used to test for quantitative differences due to treatments. Ransom et al. (2010) found no differences in how PZP-treated and untreated mares allocated their time between feeding, resting, travel, maintenance, and most social behaviors in three populations of wild horses, which is consistent with Powell's (1999) findings in another population. Likewise, body condition of PZP-treated and control mares did not differ between treatment groups in Ransom et al.'s (2010) study. Nuñez (2010) found that PZP-treated mares had higher body condition than control mares in another population, presumably because energy expenditure was reduced by the absence of pregnancy and lactation. Knight (2014) found

that PZP-treated mares had better body condition, lived longer and switched harems more frequently, while mares that foaled spent more time concentrating on grazing and lactation and had lower overall body condition. Studies on Assateague Island (Kirkpatrick and Turner 2002) showed that once fillies (female foals) that were born to mares treated with PZP during pregnancy eventually breed, they produce healthy, viable foals.

In two studies involving a total of four wild horse populations, both Nuñez et al. (2009) and Ransom et al. (2010) found that PZP-treated mares were involved in reproductive interactions with stallions more often than control mares, which is not surprising given the evidence that PZP-treated females of other mammal species can regularly demonstrate estrus behavior while contracepted (Shumake and Killian 1997, Heilmann et al. 1998, Curtis et al. 2001). There was no evidence, though, that mare welfare was affected by the increased level of herding by stallions noted in Ransom et al. (2010). Nuñez's later analysis (2017) noted no difference in mare reproductive behavior as a function of contraception history.

Ransom et al. (2010) found that control mares were herded by stallions more frequently than PZP- treated mares, and Nuñez et al. (2009, 2014, 2017) found that PZP-treated mares exhibited higher infidelity to their band stallion during the non-breeding season than control mares. Madosky et al. (2010) and Knight (2014) found this infidelity was also evident during the breeding season in the same population that Nuñez et al. (2009, 2010, 2014, 2017) studied; they concluded that PZP-treated mares changing bands more frequently than control mares could lead to band instability. Nuñez et al. (2009), though, cautioned against generalizing from that island population to other herds. Nuñez et al. (2014) found elevated levels of fecal cortisol, a marker of physiological stress, in mares that changed bands. The research is inconclusive as to whether all the mares' movements between bands were related to the PZP treatments themselves or the fact that the mares were not nursing a foal, and did not demonstrate any long-term negative consequence of the transiently elevated cortisol levels. The authors (Nuñez et al. 2014) concede that these effects "…may be of limited concern when population reduction is an urgent priority." In contrast to transient stresses, Creel et al. (2013) highlight that variation in population density is one of the most well-established causal factors of chronic activation of the hypothalamic-pituitary-adrenal axis, which mediates stress hormones; high population densities and competition for resources can cause chronic stress. Creel also states that "…there is little consistent evidence for a negative association between elevated baseline glucocorticoids and fitness." Band fidelity is not an aspect of wild horse biology that is specifically protected by the WFRHBA of 1971. It is also notable that Ransom et al. (2014b) found higher group fidelity after a herd had been gathered and treated with a contraceptive vaccine; in that case, the researchers postulated that higher fidelity may have been facilitated by the decreased competition for forage after excess horses were removed. At the population level, available research does not provide evidence of the loss of harem structure among any herds treated with PZP. Long-term implications of these changes in social behavior are currently unknown, but no negative impacts on the overall animals or populations welfare or well-being have been noted in these studies.

The National Research Council (2013) found that harem changing was not likely to result in serious adverse effects for treated mares:

> "The studies on Shackleford Banks (Nuñez et al., 2009; Madosky et al., 2010) suggest that there is an interaction between pregnancy and social cohesion. The importance of

> harem stability to mare well-being is not clear, but considering the relatively large number of free-ranging mares that have been treated with liquid PZP in a variety of ecological settings, the likelihood of serious adverse effects seem low."

Nuñez (2010) stated that not all populations will respond similarly to PZP treatment. Differences in habitat, resource availability, and demography among conspecific populations will undoubtedly affect their physiological and behavioral responses to PZP contraception, and need to be considered. Kirkpatrick et al. (2010) concluded that: "the larger question is, even if subtle alterations in behavior may occur, this is still far better than the alternative," and that the "…other victory for horses is that every mare prevented from being removed, by virtue of contraception, is a mare that will only be delaying her reproduction rather than being eliminated permanently from the range. This preserves herd genetics, while gathers and adoption do not."

The NRC report (2013) provides a comprehensive review of the literature on the behavioral effects of contraception that puts research up to that date by Nuñez et al. (2009, 2010) into the broader context of all of the available scientific literature, and cautions, based on its extensive review of the literature that:

> ". . . in no case can the committee conclude from the published research that the behavior differences observed are due to a particular compound rather than to the fact that treated animals had no offspring during the study. That must be borne in mind particularly in interpreting long-term impacts of contraception (e.g., repeated years of reproductive "failure" due to contraception)."

Genetic Effects of PZP Vaccination

In HMAs where large numbers of wild horses have recent and / or an ongoing influx of breeding animals from other areas with wild or feral horses, contraception is not expected to cause an unacceptable loss of genetic diversity or an unacceptable increase in the inbreeding coefficient. In any diploid population, the loss of genetic diversity through inbreeding or drift can be prevented by large effective breeding population sizes (Wright 1931) or by introducing new potential breeding animals (Mills and Allendorf 1996). The NRC report (2013) recommended that single HMAs should not be considered as isolated genetic populations. Rather, managed herds of wild horses should be considered as components of interacting metapopulations, with the potential for interchange of individuals and genes taking place as a result of both natural and human-facilitated movements. Introducing 1-2 mares every generation (about every 10 years) is a standard management technique that can alleviated potential inbreeding concerns (BLM 2010).

In the last 10 years, there has been a high realized growth rate of wild horses in most areas administered by the BLM, such that most alleles that are present in any given mare are likely to already be well represented in her siblings, cousins, and more distant relatives. With the exception of horses in a small number of well-known HMAs that contain a relatively high fraction of alleles associated with old Spanish horse breeds (NRC 2013), the genetic composition of wild horses in lands administered by the BLM is consistent with admixtures from domestic breeds. As a result, in most HMAs, applying fertility control to a subset of mares is not expected to cause irreparable loss of genetic diversity. Improved longevity and an aging population are expected results of contraceptive treatment that can provide for lengthening generation time; this result would be expected to slow the rate of genetic diversity loss (Hailer et al. 2006). Based on a

population model, Gross (2000) found that a strategy to preferentially treat young animals with a contraceptive led to more genetic diversity being retained than either a strategy that preferentially treats older animals, or a strategy with periodic gathers and removals.

Even if it is the case that repeated treatment with PZP may lead to prolonged infertility, or even sterility in some mares, most HMAs have only a low risk of loss of genetic diversity if logistically realistic rates of contraception are applied to mares. Wild horses in most herd management areas are descendants of a diverse range of ancestors coming from many breeds of domestic horses. As such, the existing genetic diversity in the majority of HMAs does not contain unique or historically unusual genetic markers. Past interchange between HMAs, either through natural dispersal or through assisted migration (i.e., human movement of horses) means that many HMAs are effectively indistinguishable and interchangeable in terms of their genetic composition. Roelle and Oyler-McCance (2015) used the VORTEX population model to simulate how different rates of mare sterility would influence population persistence and genetic diversity, in populations with high or low starting levels of genetic diversity, various starting population sizes, and various annual population growth rates. Their results show that the risk of the loss of genetic heterozygosity is extremely low except in case where all of the following conditions are met: starting levels of genetic diversity are low, initial population size is 100 or less, the intrinsic population growth rate is low (5% per year), and very large fractions of the female population are permanently sterilized.

It is worth noting that, although maintenance of genetic diversity at the scale of the overall population of wild horses is an intuitive management goal, there are no existing laws or policies that require BLM to maintain genetic diversity at the scale of the individual herd management area or complex. Also, there is no Bureau-wide policy that requires BLM to allow each female in a herd to reproduce before she is treated with contraceptives.

One concern that has been raised with regards to genetic diversity is that treatment with immunocontraceptives could possibly lead to an evolutionary increase in the frequency of individuals whose genetic composition fosters weak immune responses (Cooper and Larson 2006, Ransom et al. 2014a).Many factors influence the strength of a vaccinated individual's immune response, potentially including genetics, but also nutrition, body condition, and prior immune responses to pathogens or other antigens (Powers et al. 2013). This premise is based on an assumption that lack of response to PZP is a heritable trait, and that the frequency of that trait will increase over time in a population of PZP-treated animals. Cooper and Herbert (2001) reviewed the topic, in the context of concerns about the long-term effectiveness of immunocontraceptives as a control agent for exotic species in Australia. They argue that imunocontraception could be a strong selective pressure, and that selecting for reproduction in individuals with poor immune response could lead to a general decline in immune function in populations where such evolution takes place. Other authors have also speculated that differences in antibody titer responses could be partially due to genetic differences between animals (Curtis et al. 2001, Herbert and Trigg 2005). However, Magiafolou et al. (2013) clarify that if the variation in immune response is due to environmental factors (i.e., body condition, social rank) and not due to genetic factors, then there will be no expected effect of the immune phenotype on future generations. It is possible that general health, as measured by body condition, can have a causal role in determining immune response, with animals in poor

condition demonstrating poor immune reactions (NRC 2013).

Correlations between physical factors and immune response would not preclude, though, that there could also be a heritable response to immunocontraception. In studies not directly related to immunocontraception, immune response has been shown to be heritable (Kean et al. 1994, Sarker et al. 1999). Unfortunately, predictions about the long-term, population-level evolutionary response to immunocontraceptive treatments are speculative at this point, with results likely to depend on several factors, including: the strength of the genetic predisposition to not respond to PZP; the heritability of that gene or genes; the initial prevalence of that gene or genes; the number of mares treated with a primer dose of PZP (which generally has a short-acting effect); the number of mares treated with multiple booster doses of PZP; and the actual size of the genetically-interacting metapopulation of horses within which the PZP treatment takes place.

BLM is not aware of any studies that have quantified the heritability of a lack of response to immunocontraception such as PZP vaccine or GonaCon-Equine in horses. At this point there are no studies available from which one could make conclusions about the long-term effects of sustained and widespread immunocontraception treatments on population-wide immune function. Although a few, generally isolated, feral horse populations have been treated with high fractions of mares receiving PZP immunocontraception for long-term population control (e.g., Assateague Island and Pryor Mountains), no studies have tested for changes in immune competence in those areas. Relative to the large number of free-roaming wild horses in the western United States, immunocontraception has not been used in the type of widespread or prolonged manner that might be required to cause a detectable evolutionary response. Although this topic may merit further study, lack of clarity should not preclude the use of immunocontraceptives to help stabilize extremely rapidly growing herds.

Assumptions for analysis of Alternative A: This impact analysis for Alternative A assumes 2015 fertility control prescription is in place and applied annually. 100 percent capture rate would be attained for removal purposes. Only the impacts to wild horses from gathering are analyzed as all other population impacts have been analyzed in the 2009 HMAP and are incorporated by reference. This section only analyzes the impacts from conducting a bait/water and foot herding gather as the 2009 PMWHR EA and HMAP already disclosed the impacts of management utilizing a combination of methods including removals. Population modeling occurred within the HMAP and is incorporated by reference. The model shows the effects of managing for 90-120 wild horses within the 2009 HMAP won't cause a population "crash".

The Alternative A would utilize herd characteristics objectives and the removal considerations from the 2009 HMAP (page 27) when removing individual animals to the most feasible extent possible. Animals for removal are ages 1-3 in year one and concentrate on yearlings in the following years. Herd characteristic objectives have previously been analyzed in the 2009 HMAP and are incorporated by reference. The Standard Operating Procedures (Appendix 1) for handling are incorporated as part of the Proposed Action and Alternative A.

Alternative A – This would consist of an annual incremental gather of excess wild horses selectively removing wild horses in accordance with the PMWHR HMAP, beginning in summer 2018. The herd would be evaluated to determine which excess animals would be removed

annually. The gather would begin in 2018 with up to 20 excess wild horses removed. The following years as the herd is monitored annually and classified (which is done concurrent with fertility treatments and typically completed by June) the death loss and recruitment would be compared. The out years after the 2018 gather would concentrate on one year olds for excess animals to be removed. The excess animals removed would consist of any animals that weren't captured the previous year, and one year olds that were born to mares under PZP treatments. This would continue until recruitment and death loss balance out and forage use objectives were being met. The primary window for gather operations would be summer, however as opportunities arise it could occur any time of year on a limited basis. All other actions in Alternative A would be the same as same as the proposed action except non-excess animals could be relocated to other areas of the range for genetic exchange.

This alternative would be implemented in the following manner: In 2018 up to 20 excess wild horses would be removed see (Table 3).

In the following years monitoring of the herd during fertility control treatments would continue. Removal of excess wild horses would be focused on yearlings born to mares ages 2, 3 and 4 and 10 and older that are under fertility control and have had a foal outside of the 5-9 year old window. Further out, any two year old that was not gathered as a yearling would also be available for removal. This age group would be the focus due to 5-9 years olds not being under fertility control treatment unless they meet a specific threshold as identified in Environmental Assessment DOI-BLM-MT-010-2015-006-EA which is incorporated by reference. This would entail 6-12 excess wild horses removed annually until recruitment and death loss balance and forage use objectives were being met. Removal operations could be suspended annually or resumed annually based upon the number of yearlings present in relation to recruitment and death loss balancing and forage use objectives being met.

Alternative A would not make any changes to the existing fertility control prescription, it would remain as described under the No Action Alternative for fertility control.

The effects of an annual incremental gather of excess wild horses concentrating on 1-3 year old and then yearling in the following years would have the same impacts as described under the Proposed Action. Herd demographics would change slightly but impacts to the herd would be essentially the same. The effects of the continuation of the existing fertility control prescription are described in detail in the in Environmental Assessment DOI-BLM-MT-010-2015-006-EA which is incorporated by reference.

No Action Alternative – Under the no action alternative, excess wild horses would not be removed from the PMWHR at this time. The animals would not be subject to the individual direct or indirect impacts as a result of a bait/water gather operation. The population would remain above the AML, though most likely growing at a lower rate if fertility control is occurring. However, even with fertility control the herd would be close to 200 wild horses by 2017. At a future date, the HMA would require a helicopter gather as bait/water trapping gather would be infeasible. This alternative alone would not protect the range from deterioration associated with overpopulation, and preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area. Adopting this alternative would most likely result in

the need for a helicopter gather in the future which would result in a greater level of impacts to the wild horse population and individuals. The impacts to the horses themselves from the population expansion is more fighting and more injured wild horses as well as reduced body condition as forage resources are limited and have to be spread to more animals.

The no action alternative is the 2015 Fertility Control Prescription. Mares ages 2, 3, and 4 would be treated. Young mares in the one year old age class becoming two year olds could begin primer treatments in the autumn at 18 months of age. Mares ages 5-9 would not be boostered (unless they meet a threshold). Mare ages 10 would be brought back onto boosters and mares 10 and older would be treated continuously until twenty years of age. Mares 21 and older would no longer be treated. Any mare within a treatment age or meeting a threshold could be treated any time of year.

Thresholds:
Mares ages 5-9 years old that have two offspring one year and older would be brought back onto treatments. If a mare has one surviving offspring one year and older on the range after having two offspring one year and older she would remain on treatments, regardless if the one offspring was removed or died.

- When the AML is exceeded and another threshold isn't being met for an individual mare, reverse age treatment would be implemented based upon kinship representation (bloodline) beginning with the 9 year olds, and then 8 year olds if needed.

- If the population falls below 100 animals then the open age class would increase first with the 10 year olds then with the 11 year olds until the population is within 5% of the high range of AML.

Mares would be approached on foot or baited using certified weed free feeds or by utilizing existing salt placements as analyzed in the 2009 HMAP and incorporated by reference. In order to maximize efficacy, the primary window for treatment would be prior to estrus, although treated mares could receive a booster any time of the year.

Effects of the fertility control prescription that would continue under the No Action Alternative are the same as described under the Proposed Action of Environmental Assessment DOI-BLM-MT-010-2015-006-EA which is incorporated by reference.

3.3 Rangeland Health, Vegetation, and Soils

Affected Environment

A description of the affected environment is described and incorporated by reference from the 2009 PMWHR HMAP. In addition to the affected environment described in the HMAP, heavy utilization is occurring in the upper elevations and lower elevations of the wild horse range. The HMAP objective for forage utilization is to not allow more than 45% use in order to maintain or increase the composition of cool season perennial grasses within the plant communities. Based

upon monitoring data collected in 2015, 2016 and 2017 the use objective was being met in the Dryhead, parts of the of the lower elevation areas, and has continued to be met in the mid-elevation areas until recently, but not met in the high elevation areas of the wild horse range due to over-utilization by wild horses. Some use patterns of the wild horses are shifting as more time is being spent in the mid-slope areas due to guzzlers.

Monitoring data was collected in 2015, 2016 and 2017 using the key forage plant method or Landscape Appearance method. This method is an ocular reconnaissance study designed to capture forage utilization levels. This method employs the use of range utilization cages to assist the observer's ability to determine what growth occurred in relation to exclusion of grazing. These cages help prevent observation bias that could occur from year to year variability in weather patterns that directly correlate to plant production and phenology. When using this method a random directional transect is run at a study site where a reading is taken at several points. At each point a classification rating is assigned from six classes and placed on the data sheet. After the data is collected the mid-point of each use class is multiplied by the frequency of points within that use class by forage species. All values are then summed and divided by the total number of points to equal the utilization level.

In order for objectives rangeland health to be realized use levels on forage species need to be at judicious levels. An objective in the HMAP (which is incorporated by reference) is to maintain a use level of no more than 45% in order to allow these species the opportunity to persist within the system. As species are used at heavy and severe levels annually they lose robustness providing less cover, exposing more soil, allowing less palatable species to dominate which leads to increase soil loss and forage loss over time. As this is occurring Rangeland Health objectives cannot be realized.

Objective of the HMAP to modify patterns is starting to be realized. Conversely, monitoring data is showing that the population as of March 1, 2017 of 165 wild horses is beyond the capacity of the range in order to protect it from deterioration even with the use pattern shifts is too many to meet objectives. This monitoring data affirms the current population is too high and that the AML of 120 wild horses is still appropriate over the long term. Table 4 utilization data (post 2015 gather).

TABLE 4 – UTILIZATION SUMMARY 2015-2017		
Date Collected	**Measured use**	**Location**
9/30/2015	**60%**	**Key Area C-19**
9/30/2015	**62%**	**Pens - Sykes**
9/30/2015	**50%**	**Area Q**
9/30/2015	**82%**	**Little Ice Caves – Area Q**
9/30/2015	**64%**	**Upper Cheyenne – Area Q**
9/30/2015	**60%**	**Cheyanne Flat above Guzzler**
3/28/2016	**44%**	**Key Area C-18**
3/28/2016	**12%**	**Key Area C-23**
3/28/2017	**91%**	**Key Area C-20**
5/4/2016	**59%**	**Key Area C-21**
5/4/2016	**48%**	**Key Area C-17**
9/19/2016	**53%**	**Key Area C-17**
9/19/2016	**75%**	**Key Area C-21**
9/19/2016	**82%**	**Key Area C-19**
10/12/2017	**9%**	**Key Area C-18**
10/12/2017	**74%**	**Key Area C-19**
10/25/2017	**16%**	**Key Area C-17**

Environmental Impacts

Proposed Action – Removing excess wild horses to help make progress towards the AML would help bring the population in balance with multiple-use relationships in order to help achieve a thriving natural ecological balance. It would reduce stress on vegetation communities and be in compliance with the Wild Free-Roaming Horses and Burros Act, Standards for Rangeland Health, and land use plan management objectives. Rangeland health and vegetative resources would stabilize with the reduced population. Vegetative species would experience a smaller area of over-utilization by wild horses, which would lead to healthier, more vigorous forage plants and plant communities. This would result in an increase in forage availability, vegetation density, vigor, productivity, cover, and plant reproduction. Plant communities would become more resilient to disturbances such as wildfire, drought, and grazing.

Overall, soil conditions would improve if wild horse numbers were reduced on a landscape level. Less compaction would occur in riparian areas where the soils are most susceptible. Compression impacts to biological soil crusts from horses would be lessened over the area, and crust cover on the highly calcareous soils would increase. Following wild horse removal, increased vegetative and biological soil crust cover would reduce wind and water erosion.

Impacts to vegetation and soils with implementation of the proposed action would include disturbance of native vegetation immediately in and around temporary trap sites. Impacts would be by vehicle traffic and the hoof action of penned horses and would be locally severe in the immediate vicinity of the corrals or holding facilities. Generally, the activity sites would be small (less than one-half acre) in size. Soil compaction, localized wind erosion, and destruction of biological soil crusts, where present, would occur at the trap sites. Since most trap sites and holding facilities would be re-used during recurring wild horse gather operations, any impacts

would remain site-specific and isolated in nature. In addition, most trap sites would be selected to enable easy access by transportation vehicles and logistical support equipment and would generally be adjacent to or on roads, pullouts, water developments, or other flat spots that were previously disturbed. Vehicles used in the horse gather would also cause soil compaction and increased erosion in a small area. By adhering to the SOPs (Appendix 1), adverse impacts to soils would be minimized.

Alternative A –The impacts under this alternative would be similar to the proposed action, except impacts for a shorter duration, over multiple years would occur as gather operations are repeated. The area impacted around each trap site most likely would be a larger area as it would be used annually. As the population is reduced annually there would be more opportunities to adjust as based upon horse demographics and use patterns.

No Action Alternative – Under the no action alternative, wild horse population would grow 8% each year in 2018, 2019 and 2020. By 2021 the population would be over 200 wild horses. Concentrated wild horse use in parts of the PMWHR would adversely impact soils and vegetation health. With a shift in use patterns, areas in the mid-slope that have not had heavy use would now have heavy use annually. As native plant health deteriorates and plants are lost, soil erosion would increase. Continued heavy forage utilization by wild horses, at the lowest and highest elevation areas would cause further compaction, reduced infiltration, increased runoff and erosion, and loss of biological soil crusts. Compaction caused impacts would be greatest on moist soils and soils with few surface coarse fragments. The greatest disturbance impacts to crusts would occur when the soils are dry and on highly calcareous sites. The shallow soils typical of this region cannot tolerate much loss without losing productivity and reducing the ability to be re-vegetated with native plants. Invasive, non-native plant species would increase and invade new areas following increased soil disturbance and reduced native plant vigor and abundance. Wild horses likely transport weed propagules, and this transport would increase as horse numbers increase. This would lead to both a shift in plant composition towards weedy or invasive species and an irreplaceable loss of topsoil and productivity due to erosion. With the no action alternative, the localized trampling associated with trap sites would not occur, but this alternative would not make progress towards achieving and maintaining a thriving natural ecological balance.

3.4 Noxious and Invasive Plants

Affected Environment

Noxious weeds known to exist within the area are Spotted knapweed along the Burnt Timber road and tamarisk (salt cedar) along low elevation coulees and riparian zones.

Invasive plants include Russian olive, tamarisk cheatgrass, mustards, and halogeton. These plants occur primarily in the low elevation areas and in isolated occurrences within the mid-slope areas.

Environmental Impacts

Proposed Action – The proposed gather could promote the spread of existing noxious or invasive weed species. This could occur if vehicles drive through infestations and spread seed into previously weed-free areas. Certified weed-free hay would be used for bait-trapping and feeding captured horses. If noxious weeds are found, the facilities would be moved to another location. Any off-road equipment exposed to weed infestations would be cleaned before moving into weed-free areas. All trap sites, or other areas used for support of the gather on public lands would be monitored for weeds during the next several years. If found they would be treated by the BLM.

Alternative A –The impacts from this alternative would be similar to the proposed action.

No Action Alternative – Under this alternative, the wild horse gather would not take place. The likelihood of noxious weeds being spread by gather operations would not exist. However, continued overgrazing of the present plant communities could lead to an expansion of noxious weeds and invasive non-native species due to an excessive population of wild horses on the PMWHR.

3.5 Wildlife

Affected Environment

The 38,000 acre PMWHR is home to a diverse assemblage of wildlife including big game species such as mule deer, bighorn sheep, black bear, mountain lion and a very sparse population of rocky mountain elk; other species include small mammals such as bobcat, coyote, rodents, reptiles, amphibians and a diverse array of bird species, particularly many neotropical migratory birds that inhabit the range from spring through fall. The PMWHR also supports a diverse bat assemblage, with at least ten species documented.

In addition to the wildlife assemblage, important mule deer crucial winter range is found along the mid to lower elevations of Sykes Ridge in the juniper/mountain mahogany belt.

Environmental Impacts

Proposed Action – Under the Proposed Action, wildlife species would experience increased forage and cover availability due to the reduction in wild horse numbers and reduced grazing demand on the range; this would be a slightly beneficial, long-term effect compared to the No Action Alternative. Specifically, those animals that graze the same vegetation as horses or use those plants for cover, or nesting. Increased rangeland health, including soil stability and hydrologic function from reduced wild horse impacts, would benefit wildlife habitat. Mule deer crucial winter range would experience similar beneficial impacts from reduced wild horse grazing and associated impacts. Wildlife would also experience reduced competition for the limited water resources on the PMWHR due to the reduced number of wild horses resulting from the Proposed Action.

During implementation of the Proposed Action, construction and maintenance of trap sites would cause short-term, negligible impacts to wildlife populations from disruptive human activity and

habitat alteration. The small scale, both spatially and temporally, of this project would result in negligible impacts to wildlife resources; human activity is relatively high on the horse range and 5-8 trap sites would only disturb approximately ½ total acre of the entire 38,000 acre PMWHR.

Alternative A – Impacts to wildlife resources from implementing Alternative A would be negligibly different than those described under the Proposed Action.

No Action Alternative – This Alternative would result in the wild horse population remaining above the AML, causing continued degradation of wildlife habitat from current levels and potentially increased levels of wild horse grazing on plant communities which would result in reduced available forage and cover for wildlife species as well as decreased soil stability. Decreased soil stability causes erosion, soil loss and reduced abundance and vigor of plant communities, which further reduces forage and cover availability for wildlife. These effects would be similar for mule deer crucial winter range on Sykes Ridge.

The no action alternative would eliminate the negligible amount of disruptive activity and habitat disturbance associated with setting up panel traps.

3.6 Special Status Plant and Animal Species (federally listed, proposed, or candidate threatened or endangered species; State listed species; and BLM sensitive species)

Affected Environment

There are no federally listed threatened, endangered, proposed or candidate plant or animal species in the PMWHR. There are several BLM sensitive animal species present on the PMWHR, including Yellowstone cutthroat trout (Crooked Creek, on the western edge of the range), Greater Short-horned lizard (southern desert), Peregrine falcon, Brewer's Sparrow, Blue-gray gnatcatcher, Townsend's Big-Eared bat, Spotted bat, Pallid bat, and Fringed Myotis (bat). Lesica's bladderpod and Shoshonea are BLM sensitive plant species present on the PMWHR.

Environmental Impacts

Proposed Action – Impacts from the Proposed Action to special status wildlife species and habitat would be the same as those for general wildlife as described in the wildlife section. In addition, trap sites and holding corrals would not be located where sensitive plant species occur (Shoshonea and Lesica's bladderpod occurrences are well documented on the horse range), therefore there would be no direct impacts to populations of special status plant species as a result of gather operations. The reduction of wild horse numbers to meet the AML goal would decrease potential of trampling special status plant species and impacts from trailing that reduce habitat area for those plants. Overall, the Proposed Action would benefit special status plant and animal species and habitat in the long-term more than the No Action Alternative.

Alternative A – Impacts to Special Status Species resources from implementing Alternative A would be negligibly different than those described under the Proposed Action.

No Action Alternative – This Alternative would result in the wild horse population remaining

above the AML, causing continued degradation of wildlife habitat from current levels and increased levels of wild horse grazing on plant communities which would result in reduced available forage and cover for wildlife species and decreased soil stability, overall reducing rangeland health important to special status wildlife species. The higher horse population would increase potential trampling of shoshonea and bladderpod plants and reduce available habitat for them by expanding compacted trails throughout the range.

The No Action Alternative would eliminate the negligible amount of disruptive activity and habitat disturbance associated with setting up panel traps.

3.7 Wilderness

Affected Environment

The affected environment for Wilderness, including wildness study areas (WSAs) has not changed since the implementation of the 2009 HMAP, therefore the description is incorporated by reference from the 2009 Pryor Mountain Wild Horse Gather/Territory EA (MT-010-08-24) and Herd Management Area Plan (HMAP), page 69. Burnt Timber Canyon WSA, Pryor Mountain WSA, Big Horn Tack-On WSA and Bighorn Canyon National Recreation Area WSA are managed to not impair wilderness values.

Environmental Impacts

Proposed Action – Temporary impacts to opportunities for solitude could occur during gather operations due to the possible noise of increased vehicle traffic and activity around the WSAs. Those impacts would cease when the gather was completed. No surface impacts within WSA are anticipated to occur during the gather since all trap sites and holding facilities would be placed outside WSAs, except possibly Cottonwood Spring. Access to Cottonwood Spring would be along Big Coulee. Vehicles would not drive outside the active wash for access and gather operations. The trap would be made with portable panels adjacent to the old corrals and riparian exclosure at the water trough. No new surface disturbance or permanent features would occur as the area has an active erosion cycle down the coulee. Repeated traffic from Big Coulee to Cottonwood Spring could impact a visitor's experience of solitude during gather operations.

Alternative A – Under this alternative, operations would occur within the WSA at cottonwood spring eventually.

No Action Alternative – No impacts would occur to wilderness values due to gather operations; however, impacts to wilderness values of naturalness could be threatened through the continued population growth of wild horses. These impacts would result in long-term degradation to the natural environment. To some, the sight of heavy horse trails, trampled vegetation, and areas of high erosion detract from the wilderness experience.

3.8 Cultural Resources/Paleontological Resources

Affected Environment

The Pryor Mountains contain a rich prehistoric and historic archaeological record. The prehistoric archaeological types of sites located in the Pryor Mountains include, but are not limited to: quarry sites, rock art sites, rock shelter/cave sites, vision quest sites, lithic scatters, rock cairns/rock alignments, tipi rings, drive sites, wooden structure habitation sites, occupation sites, and hunting related sites. The historic archaeological types of sites located in the Pryor Mountains include, but are not limited to: rail lines, lime kilns, ranching-related sites, wooden structure habitation sites (cabins), historic trails, horse traps, homesteads, etc. Traditional cultural properties (TCP) are found throughout the area. The Dryhead Overlook and Sykes Ridge are the primary areas for TCP within the affected environment. These areas have been used for generations by Crow tribal members for traditional uses, ceremonies, and vision quest sites.

Direct impacts that could occur where wild horses concentrate include trampling, chiseling, and churning of site soils, cultural features, and artifacts; artifact breakage; and impacts from standing, leaning, and rubbing against above-ground features, structures, and rock art. Indirect impacts could include soil erosion, gullying, and increased potential for unlawful collection and vandalism. In areas where cultural site presence coincides with areas of wild horse concentration, continued grazing could contribute to substantial ground disturbance and cause cumulative, long-term, irreversible adverse effects to historic properties.

Environmental Impacts

Proposed Action – No impacts to cultural/paleontological resources would be anticipated to occur from gather operations since all trap sites and holding facilities would be inventoried to Class III intensive inventory standards for cultural resources prior to setup. Trap sites and holding facilities would be located on previously disturbed areas. If cultural resources are encountered at proposed trap sites or holding facilities, those locations would not be utilized unless it could be modified to avoid impacts to cultural resources. Once the gather is completed, reduced horse numbers would result in less hoof action around riparian spring areas where cultural resources tend to occur in higher frequency. This could lead to decreased damage to cultural resources by wild horses.

Alternative A – Same as the proposed action.

No Action Alternative – Under this alternative, the wild horse gather would not take place and therefore, no trap sites or holding facilities would be constructed. There would be no possibility that cultural resources would be damaged as a result of horse gather operations; however, higher numbers of wild horses above the AML could cause damage to cultural resources due to trampling, especially around water sources where the occurrence of cultural resources can often be high.

3.9 Recreation

Affected Environment

Recreation-related visitation has been increasing in the Pryor Mountains over the last several years and that trend is expected to continue. The area is composed of USFS, BLM, and NPS lands. Visitor logs at Penn's Cabin, located on the top of East Pryor Mountain, indicate an increase in visitor use, especially in the past five years. The logs also show an increase in both foreign and domestic visitors.

Recreation opportunities are primarily wild horse viewing during the warmer months of the year, especially during foaling season. Other opportunities include, but are not limited to, bear, deer and small game hunting, hiking, and snowmobiling. Motorized use is limited to designated roads. The area is largely managed for dispersed recreation. Hiking opportunities in the Pryor Mountains are excellent. However, there are no maintained trails for hiking or off-highway vehicle use. Other uses include camping, horseback riding, photography, sightseeing and wildlife viewing. There are several caves, some of which are large enough to explore. Special recreation permits are becoming more prevalent as more people wish to pay for the opportunity to participate in guided or organized activities on public lands. Wild horse photography tours, viewing tours, and cattle drives are the primary recreation-permitted activities. These activities provide a gateway for future visitation by an ever growing segment of the public.

Environmental Impacts

Proposed Action - Opportunities to view and photograph wild horses would be slightly diminished because some excess wild horses would be removed from the range. Opportunities from other recreation activities would be expected to be unchanged. Gather operations should be completed prior to the rifle hunting season, thus eliminating any potential conflicts with sportsmen. However, if operations are not complete, there would be minimal disruption of hunting activities since most trapping would occur in areas with more human use and activity.

Alternative A – Impacts are the same as the proposed action.

No Action - There would be no impacts to recreational wild horse observation under this alternative. However, the view-shed may become diminished over time as vegetative and riparian areas became more degraded from excess wild horse use.

3.10 Social Values and Economic Considerations

Affected Environment

A social value for the resource (outside of other resources analyzed above) within the PMWHR could include viewing wild horses, wildlife, or other features of the landscape. This type of value, also known as a non-use value, cannot necessarily be quantified, but is rather a recognition of these social values. This value could include the idea that something is still out there or how the thought of something makes a group or an individual feel including what is ethical. Conversely the value that wild horses should be subservient to other resources such as wilderness and wildlife is not quantifiable but also apparent from some scoping comments received.

The economic costs associated with the management of the PMWHR are limited to the area and

the wild horses themselves.

Proposed Action and Alternative A – Under these action alternatives, an individual's social values or ideas would be heightened if they believe that wild horses cannot overgraze, do not have impacts to rangelands, or will suffer emotional distress from gather operations. People may feel that their values or system of beliefs are being challenged, as opposed to an action that is designed to manage a herd of wild horses and resources within the PMWHR. Conversely, the social value people hold for multiple-use on public lands may be re-affirmed with these actions.

No direct economic impact would exist to individuals since wild horses cannot be used for commercial purposes, and wild horses would continue to be present after a gather operation. However, costs associated with a gather would include public consultation, environmental assessments, potential legal challenges, gather operations themselves, subsequent feed and care of excess animals, and an adoption event.

No Action – Under the no action alternative, fertility control ZonaStat-H would continue to be applied to 70-80% of the mares or possibly up to 90%. The value of a non-gather means for population control would be affirmed in the near future Parties that would litigate against the use of fertility control have a different value for its use, as the no action is not a purely hands off management approach.

The costs associated with this alternative include the continued use of PZP, along with extra monitoring and a subsequently larger gather in the future. The costs of gather operations themselves, subsequent feed and care of excess animals, and adoption events would be more expensive in the future when a greater amount of excess wild horses would exist.

4.0 CUMULATIVE IMPACTS

The cumulative impacts of implementing the 2009 PMWHR EA and HMAP and subsequent FONSI and DR, along with the Tiered EAs have been analyzed and are incorporated by reference. Therefore, only the cumulative impacts from a non-helicopter gather are discussed.

Cumulative impacts are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The cumulative analysis should be focused on those issues and resource values identified during scoping that are of major importance. Accordingly, the issues of major importance that are analyzed are maintaining rangeland health and proper management of wild horses within the established boundaries of the PMWHR.

Past, present, and reasonably foreseeable activities that may contribute to the cumulative impacts of implementing the proposed action or alternatives would include past, present and future wild horse selective removals, fertility control treatments, natural mortality including variable predation, disturbance due to recreation and hunting, and increased or decreased size and quality of rangeland available for wild horse use. BLM would identify these impacts as they occur and

mitigate them as needed on a project specific basis to maintain a thriving natural ecological balance and maintain acceptable levels of herd health. The Proposed Action and Alternative A would contribute to the cumulative impacts of future actions by helping to maintain the wild horse population closer to the AML. Monitoring and management actions would establish a process whereby biological and/or genetic issues would be identified and resolved over time. Careful selection of excess wild horses would continue to conserve the genetic health of the herd.

The cumulative impacts of the Proposed Action and Alternative A, including foal production and herd size and future growth is discussed in the 2009 EA and HMAP and incorporated by reference. In addition, the Proposed Action and Alternative A has been evaluated for cumulative impacts to the demographics (size, age structure, sex ratio) of the herd over time using WinEquus. Parameters and output for these population modeling runs are in the 2009 HMAP. Modeling efforts forecast that the cumulative impacts for the Proposed Action and Alternative A would not be expected to reduce herd growth rates below a sustainable level under conditions of average natural mortality. In addition, the average adult herd size would not fall below the existing AML of 120 adult wild horses, an important consideration in terms of maintaining genetic diversity within the Pryor herd. Additionally, according to Eggert et al.2010 "the higher the Ne/N ratio for the inbreeding effective size may indicate an avoidance of inbreeding."

Due to the relatively long time between generation (~10 years) and the long reproductive life-span of individual horses, the loss of genetic material from the herd is relatively slow and able to be monitored and mitigated by management. There would be minimal impact to herd genetic diversity by restricting first time births to later in a mare's life and reducing the lifetime contribution of older mares. Given the current levels of genetic diversity in the Pryor horses, the future application of fertility control in combination with small-scale removals to reduce herd size, would not result in damaging cumulative genetic impacts. According to Cothran 2010 "Genetic similiarity results suggest a herd with mixed ancestory that includes Spanish blood." The mix of breeds and historically introduced horses is directly responsible for the high level of genetic variation. Cothran in 2013 reitered the ancenstory from the 2010 report.

5.0 MITIGATION AND SUGGESTED MONITORING

Proven mitigation and monitoring are incorporated into the Proposed Action and Alternative A and also through standard operating procedures (SOP), which have been developed over time. These SOPs (Appendix I) represent the best methods for reducing impacts associated with this type of gathering. Monitoring and control of invasive and/or noxious plants post gather will occur, and re-seeding gather sites will occur where appropriate.

6.0 CONSULTATION AND COORDINATION

On September 14, 2017 to October 6, 2017, the BLM issued a Scoping Notice "Capture and Removal of Excess Wild Horses and Continued Fertility Control in the Pryor Mountain Wild Horse Range." The BLM asked the public to provide input that would assist in the development of a proposed action and alternatives, further identify issues, potential environmental consequences, mitigation opportunities, monitoring or provide information, data, or analysis to be used in development of an EA. The BLM will issue this environmental assessment as a

preliminary for the public to review for a 30 day period. A hearing for the use of motorized equipment (trucks and trailers) for the management of wild horses would be held prior to any gather operations.

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Appendix 1 SOP Gathers

Standard Operating Procedures for Wild Horse Gathers

The following procedures for gathering and handling wild horses would apply whether a contractor or BLM personnel conduct a gather.

Prior to any gathering operation, the BLM will provide for a pre-capture evaluation of existing conditions in the gather area(s). The evaluation will include animal conditions, prevailing temperatures, drought conditions, soil conditions, road conditions, and a topographic map with wilderness boundaries, the location of fences, other physical barriers, and acceptable trap locations in relation to animal distribution. The evaluation will determine whether the proposed activities will necessitate the presence of a veterinarian during operations.

Trap sites and temporary holding sites will be located to reduce the likelihood of injury and stress to the animals, and to minimize potential damage to the natural resources of the area. These sites would be located on or near existing roads when feasible.

The primary capture methods used in the performance of gather operations include:

1. Bait Trapping. This capture method involves utilizing bait (feed, supplement, mineral, etc.) to lure wild horses into a temporary trap.
2. Water Trapping. This method involves utilizing water sources to trap wild horses as they come to drink.

The following procedures will be followed to ensure the welfare, safety and humane treatment of wild horses in accordance with the provisions of 43 CFR 4700.

A. Capture Methods Used in the Performance of Gather Contract Operations

1. The primary concern is the safe and humane handling of all animals captured. All capture attempts shall incorporate the following:

    a. Traps and holding facilities shall be constructed of portable panels, the top of which shall not be less than 72 inches high for horses and the bottom rail that shall not be more than 12 inches from ground level. All traps and holding facilities shall be oval or round in design.

    b. All loading chute sides shall be a minimum of six feet high and shall be fully covered with plywood or metal without holes larger than two by four inches.

    c. All runways shall be a minimum of 30 feet long and a minimum of six feet high for horses and shall be covered with plywood, burlap, plastic snow fence or like material a minimum of one to five feet above ground level for burros and one to six feet for horses. The location of the government-furnished portable fly chute to restrain, age, or provide additional care for the animals shall be placed in the runway in a manner as instructed by or in concurrence with the gather crew.

    d. All crowding pens including the gates leading to the runways shall be covered with a material which prevents the animals from seeing out (plywood, burlap, plastic snow fence, etc.) and shall be covered a minimum of one to five feet above ground level, two to six feet for horses.

    e. All pens and runways used for the movement and handling of animals shall be connected with hinged self-locking or sliding gates.

2. No modification of existing fences will be made without authorization from the agency of jurisdiction.

3. When dust conditions occur within or adjacent to the trap or holding facility, the BLM will wet down the

ground with water.

4. Alternate pens within the holding facility to separate mares' small foals, sick and injured animals, strays, or other animals determined to need separate pens from the other animals. Animals shall be sorted according to age, number, size, temperament, sex, and condition when in the holding facility to minimize, to the extent possible, injury due to fighting and trampling. Under normal conditions, the government will require that animals be restrained for the purpose of determining an animal's age or sex, or for other necessary procedures. In areas requiring one or more satellite traps, and where a centralized holding facility is utilized, additional holding pens will be provided to segregate animals transported from remote locations so they may be returned to their traditional ranges. Either segregation or temporary marking and later segregation will be at the discretion of the BLM.

5. A continuous supply of fresh, clean water at a minimum rate of 10 gallons per animal per day. Animals held for 10 hours or more in the traps or holding facilities shall be provided good quality hay at the rate of no less than two pounds of hay per 100 pounds of estimated body weight per day. An animal held at a temporary holding facility through the night is defined as a horse/burro feed day.

6. If there is a contractor, it is the responsibility of the contractor to provide security to prevent loss, injury or death of captured animals until delivery to final destination.

7. Animals shall be transported to their final destination from temporary holding facilities within 24 hours after capture unless prior approval is granted for unusual circumstances. Animals to be released back into the herd management area following gather operations may be held up to 21 days or as directed by the cognizant employee. Animals shall not be held in traps and/or temporary holding facilities on days when there is no work being conducted. Animals shall not be allowed to remain standing on trucks while not in transport for a combined period of greater than three hours in any 24 hour period.

8. Animals that are to be released back into the capture area may need to be transported back to the original trap site.

B. Capture Methods That May Be Used in the Performance of a Gather

1. Capture attempts may be accomplished by utilizing bait (feed, water, mineral licks) to lure animals into a temporary trap. The following applies:

    a. Gates shall be either a swinging panel or a regular metal gate that is intended for use with the portable panel system.

    b. All traps will be manned when actively capturing wild horses.

    c. Traps shall be left open in manner that won't inadvertently trap a wild horse or wildlife when not actively trapping.

C. Use of Motorized Equipment

1. All motorized equipment employed in the transportation of captured animals shall be in compliance with appropriate state and federal laws and regulations applicable to the humane transportation of animals.

2. All motorized equipment, including horse and stock trailers shall be in good repair, of adequate rated capacity, and operated so as to ensure that captured animals are transported without undue risk or injury.

3. Only horse or stock trailers with a covered top shall be allowed for transporting animals from trap site(s) to temporary holding facilities and from temporary holding facilities to final destination(s). Sides or stock racks of all trailers used for transporting animals shall be a minimum height of six feet six inches from the floor.

4. The rear door(s) of horse and stock trailers must be capable of opening the full width of the trailer. Panels facing the inside of all trailers must be free of sharp edges or holes that could cause injury to the animals. The material facing the inside of all trailers must be strong enough so that the animals cannot push their hooves through the side.

5. Floors of horse and stock trailers and loading chutes shall be covered and maintained with wood shavings or other non-slip material to prevent the animals from slipping.

6. Animals to be loaded and transported in any trailer may include limitations on numbers according to age, size, sex, temperament and animal condition. The following minimum square feet per animal shall be allowed in all trailers:

   11 square feet per adult horse (1.4 linear foot in an 8 foot wide trailer);
   6 square feet per horse foal (.75 linear foot in an 8 foot wide trailer);

7. The BLM shall consider the condition and size of the animals, weather conditions, distance to be transported, or other factors when planning for the movement of captured animals. The BLM shall provide for any brand and/or inspection services required for the captured animals.

D. Safety and Communications

1. The Agencies involved shall have the means to communicate with all personnel engaged in the capture of wild horses utilizing a VHF/FM transceiver or VHF/FM portable two-way radio. If communications are ineffective, the government will take steps necessary to protect the welfare of the animals.

   a. All accidents occurring during the performance of any task order shall be immediately reported to the field office.

E. Site Clearances

Personnel working at gather sites will be advised of the illegality of collecting artifacts.

Prior to setting up a trap or temporary holding facility, the BLM will conduct all necessary clearances (archaeological, T&E, etc.). The proposed site(s) must be inspected by a government archaeologist. Once archaeological clearance has been obtained, the trap or temporary holding facility may be setup.

Gather sites and temporary holding facilities would not be constructed on wetlands or riparian zones.

F. Animal Characteristics and Behavior

Releases of wild horses would be near available water if the area is new to them. A short-term adjustment period may be required while the wild horses become familiar with the new area.

G. Public Participation

Opportunities for public viewing (e.g., media, interested public) of gather operations will be made available to the extent possible; however, the primary considerations will be to protect the health, safety and welfare of the animals being gathered and the personnel involved. The public must adhere to guidance from the on-site BLM representative. It is BLM policy that the public will not be allowed to come into direct contact with wild horses or burros being held in BLM facilities. Only authorized BLM personnel or contractors may enter the corrals or directly handle the animals. The general public may not enter the corrals or directly handle the animals at any time or for any reason during BLM operations.

H. Responsibility and Lines of Communication

The Wild Horse Specialist or delegate has direct responsibility to ensure human and animal safety. Billings Field Manager will take an active role to ensure that appropriate lines of communication are established between the field, field office, state office, national program office, and BLM holding facility offices. All employees involved in the gathering operations will keep the best interests of the animals at the forefront at all times.

All publicity and public contact and inquiries will be handled through the Billings Field Manager and Montana State Office of Communications. These individuals will be the primary contact and will coordinate with the COR on any inquiries.

The BLM delegate will coordinate with the corrals to ensure animals are being transported from the capture site in a safe and humane manner and are arriving in good condition.

The BLM require humane treatment and care of the animals during removal operations. These specifications are designed to minimize the risk of injury and death during and after capture of the animals. The specifications will be vigorously enforced.

G. Additional requirements for personnel conducting gather operations also include:

1. Electric prods (hotshots) will not be used routinely on horses. They can be used when animal or human safety is in jeopardy or as a last resort. Handlers do not constantly carry prods. Prods are picked up only when necessary and then put away. Electric prods are never applied to sensitive areas such as the eyes.
2. Electric prod use will not be disguised, but used openly and transparently.
3. Handling aids, including electric prods and flags will not be used abusively.
4. Flagging will be used strategically, as excessive flagging desensitizes the animal and becomes useless if used too much.
5. Gates and doors will not be deliberately slammed or shut on horses or burros passing through.
6. Excessive yelling and unnecessary noises will not be utilized in the loading and unloading process.
7. There will be no hitting, kicking, striking or beating a horse.
8. Loading or unloading of transport vehicles is performed during daylight hours, or supplemental light is provided in the area to facilitate visibility.
9. Holes, gaps, or openings will be eliminated in the loading/unloading area to avoid injury.
10. Transport vehicles will be properly aligned with the loading/unloading ramps or docks. No gaps will exist between the unloading/loading docks or ramps and the bottom or floor of the trailer's exit. No gaps exist between the trailer and the side walls of the unloading area, whereby a horse's limbs or head can become stuck or injured.

Appendix 2 SOP Fertility Control

Standard Operating Procedures for Population-level Fertility Control Treatments One-year liquid vaccine:

The following implementation and monitoring requirements are part of the Proposed Action:

1. PZP vaccine would be administered through darting by trained BLM personnel or collaborating research partners only. For any darting operation, the designated personnel must have successfully completed a nationally recognized wildlife darting course and who have documented and successful experience darting wildlife under field conditions.
2. Mares that have never been treated would receive 0.5 cc of PZP vaccine emulsified with 0.5 cc of Freund's Modified Adjuvant (FMA) and loaded into darts at the time a decision has been made to dart a specific mare. Mares identified for re-treatment receive 0.5 cc of the PZP vaccine emulsified with 0.5 cc of Freund's Incomplete Adjuvant (FIA).
3. The liquid dose of PZP vaccine is administered using 1.0 cc Pneu-Darts with 1.5" barbless needles fired from appropriate projectors designed for the dart.
4. Only designated darters would mix the vaccine/adjuvant and prepare the emulsion. Vaccine-adjuvant emulsion would be loaded into darts at the darting site and delivered by means of a capture gun.
5. Delivery of the vaccine would be by intramuscular injection into the left or right hip/gluteal muscles while the mare is standing still.
6. Safety for both humans and the horse is the foremost consideration in deciding to dart a mare. Any smooth bore gun (projector) would not be used at ranges in excess of 30 m while rifled gun (projector) would not be used over 50 m, and no attempt would be taken when other non-darting persons are within a 30-m radius of the target animal.
7. No attempts would be taken in high wind or when the horse is standing at an angle where the dart could miss the hip/gluteal region and hit the rib cage. The ideal is when the dart would strike the skin of the horse at a perfect 90° angle.
8. If a loaded dart is not used within two hours of the time of loading, the contents would be transferred to a new dart before attempting another horse. If the dart is not used before the end of the day, it would be stored under refrigeration and the contents transferred to another dart the next day. Refrigerated darts would not be used in the field.
9. No more than two people should be present at the time of a darting. The second person is responsible for locating fired darts. The second person should also be responsible for identifying the horse and keeping onlookers at a safe distance.
10. To the extent possible, all darting would be carried out in a discrete manner. However, if darting is to be done within view of non-participants or members of the public, an explanation of the nature of the project would be carried out either immediately before or after the darting.
11. Attempts will be made to recover all darts. To the extent possible, all darts which are discharged and drop from the horse at the darting site would be recovered before another darting occurs. In exceptional situations, the site of a lost dart may be noted and marked, and recovery efforts made at a later time. All discharged darts would be examined after recovery in order to determine if the charge fired and the plunger fully expelled the vaccine.
12. All mares targeted for treatment will be clearly identifiable through photographs to enable researchers and HMA managers to positively identify the animals during the research project and at the time of removal during subsequent gathers.
13. Personnel conducting darting operations should be equipped with a two-way radio or cell phone to provide a communications link with the Project Veterinarian for advice and/or assistance. In the event of a veterinary emergency, darting personnel would immediately contact the Project Veterinarian, providing all available information concerning the nature and location of the incident.
14. In the event that a dart strikes a bone or imbeds in soft tissue and does not dislodge, the darter would follow the affected horse until the dart falls out or the horse can no longer be found. The darter would be responsible for daily observation of the horse until the situation is resolved.

Appendix 3 Population Statistics

Wild horse number exclude foal numbers and population numbers were reported based on the fall population post removals of the previous calendar year until 2007 when numbers reported as of March 1 of each year.

YEAR	WILD HORSE NUMBERS	GATHERED/REMOVED	TREATED WITH FERTILITY CONTROL
1971	155 (post claim)	45	
1972	155		
1973	120 (post gather)	35	
1974	130		
1975	140 (post gather)	25	
1976	140		
1977	145 (post gather)	25	
1978	87		
1979	105		
1980	127	1	
1981	155	6	
1982	144 (post gather)	43	
1983	147 (post gather)	21	
1984	141 (post gather)	13	
1985	139 (post gather)	25	
1986	155	0	
1987	147 (post gather)	23	
1988	130 (post gather)	26	
1989	122 (post gather)	21	
1990	133	3	
1991	120 (post gather)	16	
1992	115 (post gather)	46	
1993	143	1	
1994	118 (post gather)	51	
1995	146	0	
1996	175	0	
1997	147 (post gather)	46	
1998	158	0	
1999	173	1	
2000	188	0	
2001	160 (post gather)	46	6 mares
2002	170	0	14 mares
2003	161	7	14 mares
2004	142	0	4 mares
2005	160	0	12 mares
2006	145 (post gather)	22	17 mares
2007	159	0	27 mares
2008	170	0	0
2009	195	57	40 mares with PZP-22
2010	134 + 11 off Range (145)	0	12 mares and 40 mares carryover from PZP-22
2011	145	0	36 mares
2012	170 (132 post gather)	38 + 7 foals (45 total)	63 mares
2013	145	0	52 mares
2014	159	0	63 mares
2015	170 (152 post gather)	18	75 mares
2016	160	0	60 mares
2017	165	0	61 mares

Appendix 4 Summary of PZP Use

SUMMARY OF PZP USE ON THE PRYOR MOUNTAIN WILD HORSE RANGE					
Year	Environmental Assessment	Number and age of mares identified for treatment	PZP Formulation	Total treated	Total Pop. (as officially reported)
2001	Pryor Mountain Wild Horse Range FY2001 Wild Horse Population Gather and Selective Removal EA Number MT-010-1-44	11 fillies of one and two year olds	One year liquid applied during a gather in the chute	11	160 post gather fall pop
2002	FY2002 Humane-Use of Fertility Control on Select Young Wild Horse Mares EA Number MT-010-02-22	12 one year olds and 7 two year olds	One year liquid remote dart	19	170 fall pop.
2003	FY2003: Fertility Control on Select Wild Horse MaresFY2003: Selective Removal of Young Wild Horse Stallions EA # MT-010-03-14	7 yearlings, 9 two year olds, and 8 over fourteen	One year liquid remote dart	24	161 post gather fall pop. (High foal mortality)
2004	FY2004: Fertility Control on Age-Specific Wild Horse Mares EA # MT-010-04-18	5 yearlings, 4 two year olds, and 7 over fourteen	One year liquid remote dart	16	142 fall pop. (Foal crop died)
2005	FY2005: Use of Fertility Control on Mares 11 Years of Age and Older to Suppress Herd Growth Rates EA # BLM- MT-010-FY05-16	mares over the age of 11	One year liquid remote dart	21	160 fall pop.
2006	Pryor Mountain Wild Horse Population Control 2006 EA # BLM- MT-010-FY06-19	Mares over 11	One year liquid remote dart	22	145 fall pop. post gather
2007	Pryor Mountain Wild Horse Population Control 2006 EA # BLM- MT-010-FY06-19	Mares over 11	One year liquid remote dart	27	154
2008	Pryor Mountain Wild Horse Population Control 2006 EA # BLM- MT-010-FY06-19	Mares over 11	No application, budget reduced	0	170
2009	Pryor Mountain Wild Horse Range 2009 Gather Plan and Environmental Assessment (EA) MT-C010-2009-35	42 mares over the age of one	22 month pellet applied during a gather in the chute	40	195 (125 post gather)
2010	Pryor Mountain Wild Horse Population Control 2006 EA # BLM- MT-010-FY06-19	Mares over 11	One year liquid remote dart	12	140-150 (11 from outside HMA returned)
2011	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 11 and older	ZonaStat-H remote dart	36	159
2012	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 11 and older	ZonaStat-H remote dart	63	172 (134 post gather)
2013	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 11 and older	ZonaStat-H remote dart	52	145
2014	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 11 and older	ZonaStat-H remote dart	63	159
2015	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 10 and older, or if meeting threshold	ZonaStat-H remote dart	75	170
2016	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 10 and older, or if meeting threshold	ZonaStat-H remote dart	60	160
2017	Pryor Mountain Wild Horse Range Fertility Control Environmental Assessment December 2010 DOI-BLM-MT-0010-2011-0004-EA	Mares 2,3,4 and 10 and older, or if meeting threshold	ZonaStat-H remote dart	61	165

Appendix 5 Herd Demographics

NAME	NUMBER	SEX	DISPOSITION	COLOR	AGE AS OF 1/1/2018	PZP LAST DOSE	ADJUVANT
Dryhead							
Jesse James	200928	Male	Band Stallion	Bay	9		
Cecelia	200224	Female	Mare	Black	16	5/2/16	Inc
Penn	201514	Female	Mare	Black	3		
Hickock	200711	Male	Band Stallion	Bay	11		
Seneca	199926	Female	Mare	Dun	19	4/6/17	Inc
Nova	201315	Female	Mare	Red Dun	5	5/15/17	Inc
Rigel Starr	201701	Female	Filly		1		
Prima	201510	Female	Mare	Red Dun	3	5/15/17	Mod
Kitalapha	201013	Female	Mare	Grulla	8	4/7/17	Inc
Quasar	201601	Male	Colt	Grullo	2		
Hawk	200702	Male	Band Stallion	Black	11		
Fresia	200503	Female	Mare	Grulla	8	4/17/17	Inc
Parry	201505	Male	Colt	Red Dun	3		
Oak	201407	Male	Colt	Dun	4		
Hidatsa	200713	Male	Band Stallion	Grullo	11		
Bakken	200103	Female	Mare	Grulla	17	4/6/17	Inc
La Nina	201317	Female	Mare	Dun	5	4/20/17	Inc
Pax	201513	Male	Colt	Grullo	3		
Kemmerer	201002	Male	Band Stallion	Dun	8		
Waif	199708	Female	Mare	Bay	21	4/20/17	Mod
Fools Crow	200533	Male	Band Stallion	Blue Roan	13		
Jewel	200901	Female	Mare	Dark Bay	9	6/3/15	Inc
Halo of the Sun	200704	Female	Mare	Dark Bay	11	7/21/17	Inc
Johnston	200911	Male	Band Stallion	Grullo	9		
Icara	200801	Female	Mare	Dark Bay	10	4/18/17	Inc
Phantom	201501	Female	Mare	Dark Bay	3	7/21/17	Inc
Morgana	201201	Female	Mare	Bay	5	3/9/2016	Inc
Niobrara	201309	Female	Mare	Bay Roan	5	4/10/17	Inc
Dryhead horses in transit							
Strawberry	199702	Female	Mare	Grulla Roan	21	4/11/17	Inc
Dryhead Bachelors							
Joseph	200901	Male	Bachelor	Black	9		
Blizzard	200113	Male	Bachelor	Apricot	17		
Johan	200910	Male	Bachelor	Dun	9		
Inniq	200831	Male	Bachelor	Black	10		
Jemez	200902	Male	Bachelor	Apricot Dun	9		
Hidalgo	200717	Male	Bachelor	Dun	11		
Oglala	201405	Male	Bachelor	Dark Bay	4		
Fiero	200510	Male	Bachelor	Grullo	13		
Burnt Timber							
Garay	200615	Male	Band Stallion	Grullo	12		
Kohl	201030	Female	Mare	Black	8	3/27/14	Inc
Petite Colour	201509	Female	Mare	Black	3	4/14/17	Inc
Jacinta	200922	Female	Mare	Dun	9	4/19/17	Inc

Rio-Rue	201705	Male	Colt	Dun	1		
Patriot	201512	Male	Colt	Grullo	3		
Noble	201301	Female	Mare	Chestnut	5	3/28/17	Inc
Doc	200325	Male	Band Stallion	Bay	15		
Firestorm	200517	Female	Mare	Red Roan	13	4/7/17	Inc
Heritage	200732	Female	Mare	Red Roan	11	6/14/17	Inc
Brumby	200128	Female	Mare	Grulla	17	3/22/17	Inc
Jasmine	200906	Female	Mare	Blue Roan	9	3/1/16	Inc
Ryden	201708	Male	Colt	Black/Roan	1		
Hernando	200715	Male	Band Stallion	Bay	11		
Phoenix	199104	Female	Mare	Palomino	27	2/3/15	Inc
War Bonnet	199311	Female	Mare	Red Roan	25	2/3/15	Inc
Cappuccino	200216	Male	Band Stallion	Dun	16		
Gabrielle	200607	Female	Mare	Dun	12	3/22/17	Inc
Paterson	201508	Male	Colt	Dun	3		
Moenkopi	201205	Female	Mare	Dun	6	3/10/16	Inc
Galaxy	200603	Male	Band Stallion	Black	12		
Ireland	199720	Female	Mare	Red Roan	21	4/19/17	Inc
Quillan	201607	Female	Filly	Black	2		
Pegasus	201511	Female	Mare	Black	3	4/14/17	Inc
Limerick	201105	Female	Mare	Black	7	2/24/15	Inc
Pococeno	199425	Female	Mare	Black	24	4/2/15	Inc
Hera	200733	Female	Mare	Blue Roan	11	4/7/17	Inc
Nirvana	201307	Female	Mare	Grulla Roan	5	3/29/17	Inc
Gringo	200621	Male	Band Stallion	Bay	12		
Beulah	200108	Female	Mare	Red Roan	17	4/5/17	Inc
Tecumseh	199804	Male	Band Stallion	Red Roan	20		
Galadriel	200622	Female	Mare	Bay	12	3/28/17	Inc
Garcia	200616	Male	Band Stallion	Grullo	12		
Greta	200601	Female	Mare	Bay	12	4/6/17	Inc
Quaid	201604	Male	Colt	Black	2		
Norma Jean	201311	Female	Mare	Bay	5	3/22/17	Inc
Naara	201308	Female	Mare	Dun	5	3/22/17	Inc
Aztec	200017	Female	Mare	Grulla	18	4/5/17	Inc
Knight	201016	Male	Band Stallion	Roan	8		
Nimbus	201305	Female	Mare	Palomino	5	3/23/17	Inc
Outlaw Lady	201410	Female	Mare	Dun	4	4/6/17	Inc
Grijala	200618	Male	Band Stallion	Bay	12		
Graciana	200614	Female	Mare	Grulla	12	4/14/17	Inc
Oceana	201418	Female	Mare	Sorrel	4	3/28/17	Inc
Jasper	200905	Male	Band Stallion	Bay	9		
Ketchikan	201008	Female	Mare	Dun	8	5/19/15	Inc
Okiotak	201420	Male	Bachelor	Sorrel	4		
Lariat	201110	Female	Mare	Bay	7	5/19/15	Inc
Oklahoma	201416	Male	Bachelor	Dun	4		

London	201109	Male	Band Stallion	Bay	7		
Petra	201507	Female	Mare	Black	3	4/19/17	Inc
Quahneah	201608	Female	Filly	Dun	2		
Bacardi	200120	Female	Mare	Blue Roan	17	6/19/17	Inc
Burnt Timber Bachelors							
Malpais	201214	Male	Bachelor	Black	6		
Jackson	199823	Male	Bachelor	Dun	20		
Naolin	201313	Male	Bachelor	Dun	5		
Orlando	201402	Male	Bachelor	Bay	4		
Okomi	201411	Male	Bachelor	Dun Roan	4		
Jupiter	200923	Male	Bachelor	Grullo	9		
Oracle	201404	Male	Bachelor	Dun	4		
Duke	199615	Male	Bachelor	Bay	22		
Sykes							
Morning Star	199618	Male	Band Stallion	Bay	22		
Felina	199814	Female	Mare	Red Dun	20	5/25/17	Inc
Gaelic Princess	200623	Female	Mare	Grulla	12	5/25/17	Inc
Hataalii	200703	Female	Mare	Dun	11	5/25/17	Inc
Reverie	201706	Female	Filly	Dun	1		
Hailstorm	200734	Female	Mare	Blue Roan	11	6/19/17	Inc
Bolder	200122	Male	Band Stallion	Palomino	17		
Celt	200207	Female	Mare	Black	16	5/4/17	Inc
Bailey	200140	Female	Mare	Black	17	6/14/17	Inc
Blue Moon	200131	Male	Band Stallion	Blue Roan	17		
Sequoyah	199717	Female	Mare	Dun	21	4/19/17	Inc
Halcyon	200706	Female	Mare	Red Roan	11	3/23/17	Inc
Quanah	201602	Male	Colt	Grullo	2		
Amethyst	200010	Female	Mare	Dun	18	5/11/17	Inc
Inocentes	200806	Female	Mare	Dun	10	4/19/17	Inc
Orielle	201419	Female	Mare	Bay	4	3/28/17	Inc
Fiasco	200526	Female	Mare	Grulla	13	3/27/17	Inc
Prospera	201502	Female	Mare	Bay Roan	3	4/14/17	Inc
Irial	200812	Male	Band Stallion	Blue Roan	10		
Blue Sioux	199319	Female	Mare	Blue Roan	25	1/22/15	Inc
La Brava	201104	Female	Mare	Red Roan	7	1/25/15	Inc
Adona	200028	Female	Mare	Blue Roan	18	4/17/17	Inc
Fools Gold	200534	Female	Mare	Dun	13	4/12/17	Inc
Pele	201504	Female	Mare	Dun	3	5/4/17	Inc
Dove	200315	Female	Mare	Buckskin	15	5/4/17	Inc
Manuelita	201224	Female	Mare	Dark Buckskin	6	5/3/16	Inc
Pilar	201515	Female	Mare	Bay	3	6/14/17	Inc
Scarlett	199525	Female	Mare	Blue Roan	23	3/30/15	Inc
Mascelaro	199515	Male	Band Stallion	Dun Roan	23		
Polaris	199732	Female	Mare	Black	21	4/7/17	Inc
Rosarita	199608	Female	Mare	Dun	22	3/15/16	Inc
Half Moon	200718	Female	Mare	Bay	11	3/37/17	Inc
Broken Bow	199315	Female	Mare	Dun	25	1/7/15	Inc
Feldspar	200523	Female	Mare	Grulla	13	4/5/17	Inc
Quintana	201506	Female	Filly	Grulla	2		
Pride	201506	Male	Colt	Buckskin	3		

Mica	201211	Male	Band Stallion	Blue Roan	6		
Aurora	200036	Female	Mare	Bay	18	4/19/17	Inc
Horizon	200707	Male	Band Stallion	Dun	11		
Demure	200313	Female	Mare	Grulla	15	4/14/17	Inc
Juniper	200914	Female	Mare	Buckskin	9	5/9/13	
Ruby	201709	Female	Filly		1		
Galena	200604	Female	Mare	Black	12	3/27/17	Inc
Helenium	200710	Female	Mare	Dun	11	4/19/17	Inc
Quintasket	201603	Female	Filly	Sorrel	2		
Hamlet	200714	Male	Band Stallion	Black	11		
Sapo	199801	Female	Mare	Grulla	20	4/20/17	Inc
Maia	201203	Female	Mare	Red Roan	6	5/3/16	Inc
Sykes horses in transit							
Niyah	201306	Female	Mare	Red Roan	5	4/17/17	Inc
Sykes Bachelors							
Nodin	201303	Male	Bachelor	Grullo	5		
Nickle	201303	Male	Bachelor	Dun	5		
Missoula	201202	Male	Bachelor	Sorrel	6		
Miocene	201209	Male	Bachelor	Grullo	6		
Killian	201003	Male	Bachelor	Palomino	8		
Lobo	201106	Male	Bachelor	Dun	7		
Oro	201412	Male	Bachelor	Bay Roan	4		
Missing horses							
Baja	199629	Male	Band Stallion	Dun	22		
Washakie	199421	Female	Mare	Dun	24	1/7/15	Inc
Corona	199725	Male	Band Stallion	Bay	21		
Sacajewa	199605	Female	Mare	Grulla	22	4/18/16	Inc
This Table is derived from data provided to the BLM from the PMWMC and supplemented by BLM and NPS data.							